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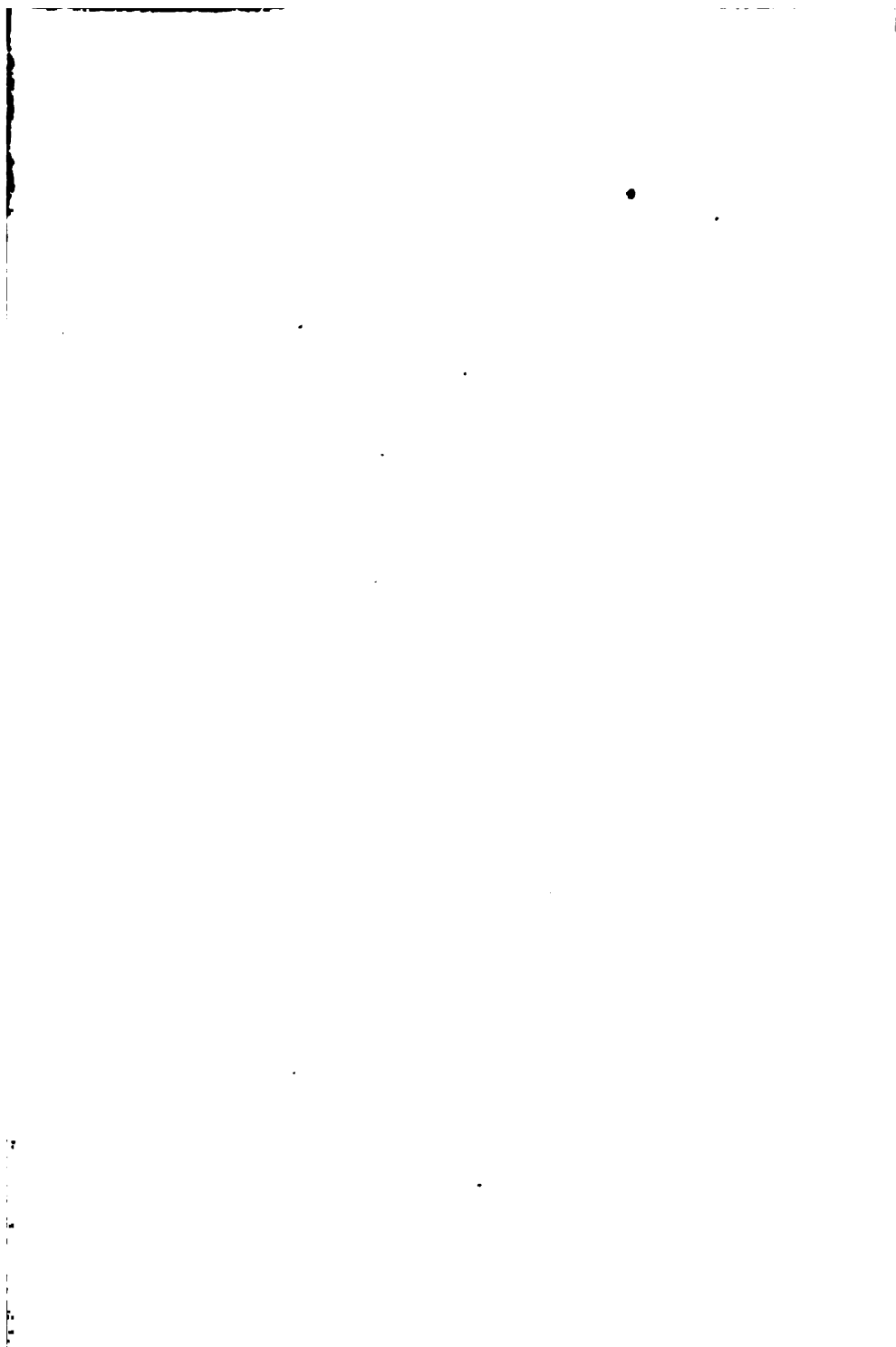
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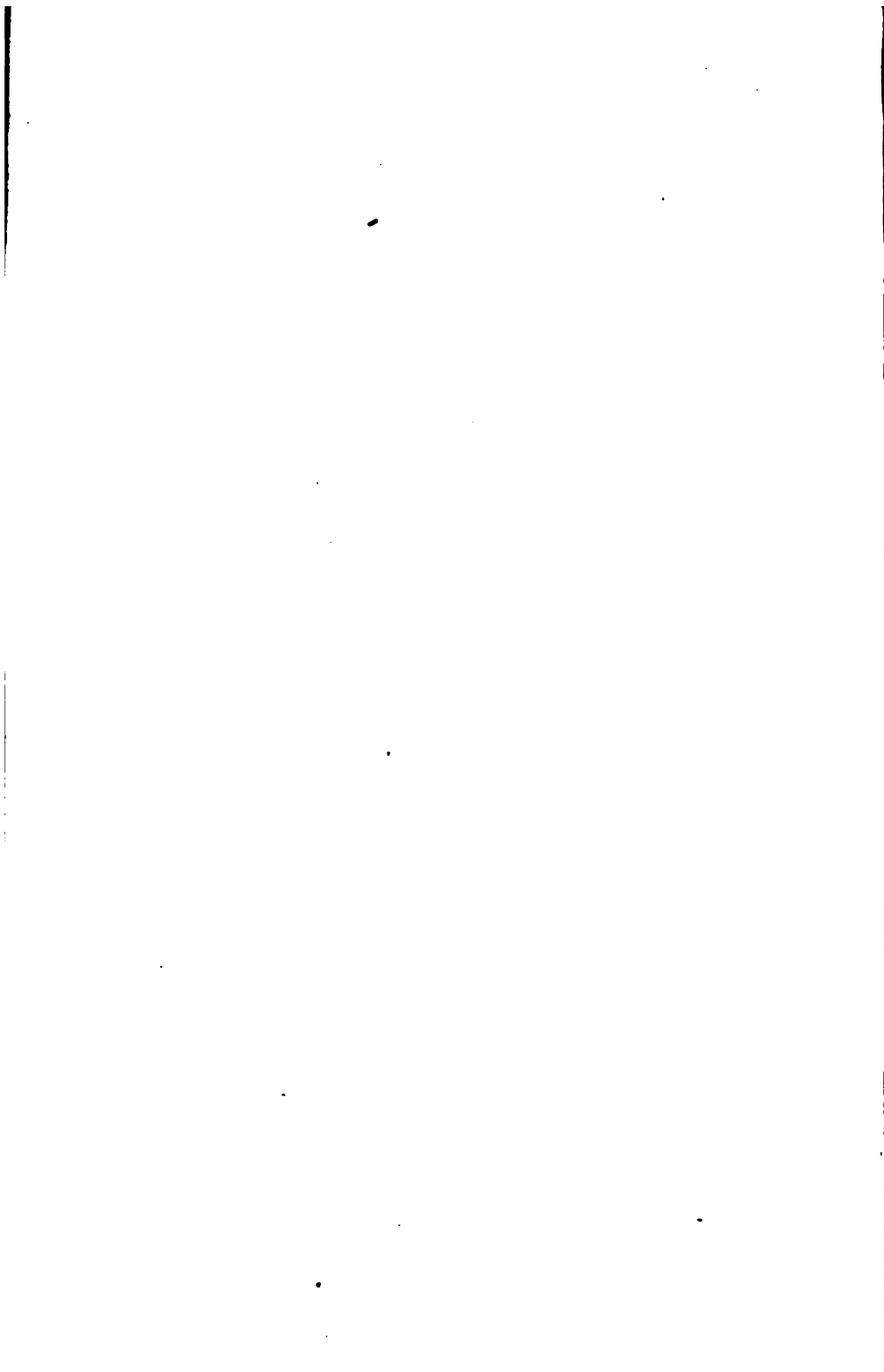
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THE LIVERPOOL
MEDICAL AND SURGICAL REPORTS.

1867.



THE
LIVERPOOL
MEDICAL & SURGICAL REPORTS.

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PREFACE.

THIS Volume has been undertaken with the object of presenting to the Profession a series of articles of a practical nature, founded, for the most part, on the experience that is afforded by the public Medical and Surgical Charities of Liverpool, which, in size and importance, are well proportioned to a town containing upwards of half a million inhabitants.

This, the first annual number, embraces contributions from Medical Officers connected with the Royal Infirmary and its School of Medicine, the Northern, Eye, and Fever Hospitals, and the Ladies' Charity; but it is hoped that future volumes will be further enriched by others having similar fields for observation and research.

All the papers have been corrected for the press by their respective authors, a task which has materially lightened the Editorial duties.

The great success that has attended the publication of Reports in connection with some of the London Hospitals, induces us to hope that these endeavours to promote and foster clinical enquiry will not be unappreciated by our professional brethren.

THE EDITORS.

LIVERPOOL, *October*, 1867.

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LIVERPOOL MEDICAL AND SURGICAL REPORTS.

CASES OF PARALYSIS,

WITH CLINICAL OBSERVATIONS,

By JAMES TURNBULL, M.D.,

PHYSICIAN TO THE LIVERPOOL ROYAL INFIRMARY.

CASE 1.—*Hemiplegia, with muscular rigidity and pain following Epileptiform Convulsions.—Treatment by leeches and counter-irritation, by Bromide of Potassium and Galvanism.—Perfect recovery.—Observations.*

ELIZABETH SPENCER, a healthy-looking woman, a cook, aged 26, was admitted into the Infirmary on the 22nd of November, 1866, with paralysis of the left side. She stated that her illness began two months before admission, with fits. She was seized with the fits without warning, sometimes at night, and as often as three times in a day. She became unconscious during them, but had never bit her tongue or injured herself. The left side only had been affected by the convulsive attacks. From the commencement of the fits, the left side became weak, and this gradually increased till it was completely paralysed and useless.

On admission, there was complete loss of power of the left side, and the arm was rigid and painful, and the pain was increased by extension. The speech was affected, and the vision of the right eye impaired. There was pain in the head and febrile disturbance, the tongue was furred, and she complained urgently of want of sleep.

Nine leeches were applied to the head and gave great relief, and she was freely purged with compound jalap powder. As she did not sleep, she took a draught containing 15 grains of bromide of potassium, at six o'clock in the evening, and again at nine, which

seemed to have the effect of causing sleep. She was subsequently blistered at the nape of the neck. By these means the pain in the head and the painful rigidity in the arm were completely removed, but she scarcely regained any power in the arm or the leg. On the 31st December she had recovered, so far as to be able to be set on a chair by the side of the fire, and she then said that she felt quite well in health, but had no use of the arm or leg. They were in fact quite powerless. Galvanism was applied the following day, and very soon produced a marked beneficial effect on both the arm and the leg. In a fortnight she was able to make some use of the arm, and could walk dragging the foot. She continued to regain strength and power under this treatment, and on the 4th of February she was discharged, being quite well.

Observations.—This case was the subject of some clinical remarks at the time it occurred. It was then observed that it presented many points of interest, in regard both to the symptoms which were well marked, and also in regard to the treatment which was carried out, with the two definite objects, of first removing inflammatory action in the brain and membranes, and of afterwards rousing the lost or suspended power of motion. The diagnosis as to the part of the brain affected, and the exact nature of the diseased action, is often obscure in such cases. The history was different from that of ordinary cases of hemiplegia from sanguineous apoplexy or cerebral softening, the loss of power having commenced with epileptiform convulsions. It is well known that epileptic fits are not unfrequently followed by attacks of paralysis, which are generally of a temporary nature, and seldom last more than a few days. Such attacks of temporary paralysis are usually the effects of the congestion produced by the fits, which, Trousseau tells us, will sometimes cause spots of ecchymosis on the face, and also a similar effect on the brain and its membranes, and even effusion of blood into its substance. The connection between hemiplegia and epilepsy has also been illustrated by Dr. Todd, in one of his lectures on what he has termed epileptic hemiplegia. As, however, there was no evidence of epilepsy in this case previous to the patient's illness, I looked on the fits not as the cause, but a symptom, of an affection of the brain. From the pain and rigidity

in the paralysed arm, the pain in the head and the febrile disturbance, it was inferred that there was inflammation of the brain and membranes of the right hemisphere, and that it had extended to or involved the central parts, the corpora striata or optic thalami; and that there might be a clot which had set up the irritation. The effect of local depletion and counter-irritation in removing pain and rigidity seems to show that there must have been inflammatory action, but we have no certain means of knowing whether it was caused by a clot or not. The gradual accession of the palsy, and the completeness of recovery, would rather tend to show that there was no such complication.

For about five weeks after the symptoms of irritation of the brain had been removed, the patient was kept quiet in bed, with light nourishment, the object being to promote nature's efforts to repair local mischief by absorption whether of effused blood, or of the products of inflammation. Having allowed sufficient time for this purpose, galvanism was employed with the view of giving a local stimulus to the paralysed parts. I have seen galvanism of use in some local forms of paralysis, but I have not seen much advantage from its application in hemiplegia, or paralysis dependent on cerebral disease. In this case, however, it acted well, and so speedily, that it seemed to draw out a latent power; and within a month from the time it was first applied, she had completely regained the use of all the paralysed parts.

In the early stage of the case the bromide of potassium was employed to procure sleep. This remedy has a powerful sedative influence on the nervous system, which medical men have lately become more fully aware of. It was used only at first, for a few days, to promote sleep, and it seemed to produce this effect.

CASE 2. — Paraplegia, with complete loss of power of the lower extremities, impaired sensation, and sloughing over the sacrum. Slow recovery, with sustaining tonic treatment and cod-liver oil.

ROBERT BOAG, a sailor, 21 years of age, of healthy but not robust appearance, was admitted into the Infirmary on the 21st of December, 1866, with complete loss of power of both legs. He could

not move them at all, and the sensation in the feet and legs was also impaired. The power over the bladder was also diminished, so that he could not completely retain the urine. A large slough of quite six inches in diameter formed over the sacrum, completely exposing it, and causing a long continued profuse discharge. When admitted, he had only been ill for a week, but though he was closely questioned, no satisfactory explanation of the cause of his illness could be obtained. He had not met with any injury, and there was no tenderness or any sign of disease of any part of the spinal column, but the disease had speedily reached the condition of complete palsy of both legs and the lower part of the body. It seemed probable that the complete interruption of the nervous influence from the brain must have arisen from extravasation into or upon the cord, or some organic change in its substance, and as the prostration of the patient precluded any active interference, the treatment consisted in attending to the secretions, placing the patient on a water bed, and giving him stimulants, quinine, and nutritious food. He had a good appetite and digestion, but when he had been three months in hospital he had become very weak and emaciated, and his condition appeared altogether very hopeless. The large sore, however, on the sacrum was contracting. Cod-liver oil was then given, and a gradual improvement followed. He gained flesh and strength, and began to draw attention to his power of moving, first his toes, and afterwards his legs. He went on steadily improving, the sore contracting, and the power in the legs increasing, till he was able to get up and walk with two sticks.

On the 15th of May, 1867, he was sufficiently well to be discharged.

On the 1st of July he came again to the Infirmary to show himself. He had then acquired a healthy appearance, and though there was still some weakness in the legs, he had crossed the river from Cheshire, and had, with the aid of one stick, walked between three and four miles. The sore on the sacrum was nearly, but not quite, healed.

Observations.—We cannot suppose that in this case the loss of power arose from reflex action. There must have been some lesion of the cord itself, or pressure upon it, interrupting the nervous

current, and the case is interesting, as showing the amount of reparation which is possible in paraplegia of the most severe kind. The treatment was essentially sustaining and tonic, with the view of aiding Nature's efforts to repair any lesion of the cord, and to heal the large sore on the sacrum. Cod-liver oil was given for this purpose, and produced such a decided effect that a curative influence may be ascribed to it, and it is a remedy from which I have seen signal benefit in some other cases of this disease.

The two following cases illustrate the effects of syphilis on the nervous system in causing, in the first, paralysis of motion; and in the second, numbness and loss of sensation, with slight loss of motary power.

CASE 3.—Paraplegia, with syphilitic eruption.—Treatment by Mercury and Iodide of Potassium.—Partial recovery.

JAMES MURDOCK, a sailor, aged 28, was admitted into the Infirmary on the 9th of April, 1867. He had suffered from primary syphilis five months previous, and an eruption came on his back and face about a month after. For this he was treated with baths of calomel fumigation, and he then went to Scotland for change of air. This was ten weeks before admission. He was well when he got into the train, but when he reached the station he was unable to walk or stand, having lost the power of his legs without feeling any pain.

On admission, there was a tuberculous eruption on the face, more particularly the right side of the forehead, and there were also some marks of the first eruption, which had not been entirely removed by the mercurial fumigation. His legs were so paralysed that he could scarcely use them. They shook and trembled under him, and he could only walk a few steps with the aid of a stick and of some one holding him. There was no pain anywhere, and no loss of sensation in the legs and feet.

He was brought under the influence of mercury by means of small doses of blue pill with opium, and the use of iodide of potassium was afterwards conjoined with it. Under this treatment he improved, and gained more power in the legs. On the 27th of May the eruption was entirely removed from the face, and

his legs were stronger, but he had still to use two sticks in walking. From this time the mercurial treatment was laid aside, and he took the iodide of potassium only. Though galvanism was afterwards used, he did not, from this time till the 25th of June, when he was discharged at his own request, make much further progress.

CASE 4.—Numbness and loss of sensation in fingers and toes, with some muscular weakness.—Syphilitic Rupia.—Treatment by Mercury and Iodide of Potassium.—Perfect recovery.

ALFRED WYNN, an iron moulder, aged 35, was admitted into the Infirmary on the 17th of June, 1867, on account of numbness of the ends of the fingers of both hands and the toes of both feet. He stated that he had been in the Infirmary five years before, when he had been similarly and more severely affected. He had suffered from syphilis thirteen years previous, and on admission he had spots of syphilitic rupia on the head, back and legs. The fingers were numb and dead, so that he could not feel when they were pinched. He was also unable to lay hold of and pick up small objects. The loss of feeling had begun three months before, and was increasing. On the former occasion there had been greater loss of muscular power in both the hands and the feet, which had been entirely removed by treatment. He was treated by mercury, and the gums were kept slightly under its influence till the numbness and want of sensation were entirely removed. Iodide of potassium was also given, and continued after the eruption had disappeared. On the 25th of July he had no feeling of numbness, and the eruption was entirely removed.

Observations.—The affections of the brain and spinal cord, which are produced by the syphilitic poison, are, as a general rule, more under the influence of treatment than other forms of paralysis. In the case, however, of Murdock, though mercury and iodide of potassium were both fairly tried, the improvement up to the time of the patient's discharge was not as great as might have been expected in a case of paraplegia due entirely to this cause; and it is worthy of observation that the loss of power came on quite suddenly, while he was travelling in a railway carriage.

The loss of power in the nerves of sensation, which was the prominent symptom in Wynn's case, is a more rare effect of syphilis. That it was due to this cause there could not be any doubt, and the recovery of the patient under similar treatment on both occasions confirmed this view of the nature of the case. In most cases where there is loss of motary or sensitive power from cerebral disease, one side only is affected, but in this case not only both hands but also both feet were affected; and in this action of the syphilitic poison we see an effect analogous to that of lead poison, which generally acts on both sides, and often paralyses the extensor muscles of the feet as well as those of the hands.

The most extensive paralysis which has ever come under my observation occurred in a gentleman, who was covered with a syphilitic eruption. It began with paraplegic weakness of the legs, which in a few days extended upwards, till the whole body, except the neck, head, and face, was affected. He was perfectly helpless, unable to raise his hands to his head, and even the respiration was somewhat impeded. With some difficulty he was brought under the influence of mercury. The eruption then began to fade, and there was a gradual return of power, first in the arms, and more slowly in the legs. He ultimately regained the power of walking, though he had always some paraplegic weakness afterwards.

In what way does syphilis affect the brain and the spinal cord in these cases? It appears to do so in most cases indirectly, and the *dura mater* may be thickened, as the external periosteum is when nodes are formed, and the disease may thus extend to the membranes and the surface of the brain itself. The arterial coats are sometimes affected by the poison, and in this way, as well as by its direct action on the brain, the nutrition of the organ may be injured. Professor Jaksch has stated that, in twelve fatal cases of syphilitic paralysis, the pathological appearances in the brain were—in six instances softening in the cerebrum (sometimes with and sometimes without gummy tumours), in one case softening of the cerebellum, in three cases abscess of the brain, and in two atrophy of the white substance.

INJURIES OF THE TRACHEA,
WITH REMARKS, BY JAMES LONG, F.R.C.S.,

CONSULTING SURGEON TO THE ROYAL INFIRMARY.

(Case reported by Mr. CHAUNCEY PUZEY, House Surgeon, Royal Infirmary.)

WILLIAM TURNBULL, a spare but healthy-looking lad, aged 6, was admitted into the Liverpool Royal Infirmary, on August 27th, 1865, under the care of Mr. Long.

He had just fallen out of a second floor window, into a court, striking his throat against the leg of a table (lying upside down), with such force as to break the leg from the table.

On admission, he was in a semi-collapsed state. Below the chin was a lacerated wound, about three inches long, communicating with the interior of the mouth. Just below the cricoid cartilage was a bruised spot; the whole of the neck and upper part of the chest were emphysematous, so that by examination the state of the parts underneath could not be ascertained. The voice was indistinct and husky, the respiration croupy; on listening to the respiration, crepitation was heard in every part of the chest, especially over the bifurcation of the trachea and larger bronchi, arising probably from emphysema of the cellular tissues of the mediastrum and lungs.

Soon after admission the boy vomited, the face became puffy and livid, and the emphysema quickly extended to the umbilicus.

Four hours after admission, Mr. Long, who had been sent for, made a free incision from the wound below the chin, to a point a little above the sternum, air was seen bubbling up from the centre of the wound at each expiration, and after a little dissection a hole was seen in the trachea, just below the cricoid cartilage; into this a tube was speedily introduced, the state of the boy forbidding any minute examination of the parts.

The boy was put on a milk diet, with occasional stimulants as required, and kept in a luke-warm atmosphere, of uniform temperature. This is easily arranged by placing over the upper half of the body a cover like the top of a covered cart, placing a kettle on the fire with a vulcanized india rubber tube attached to the spout, the end of the tube being placed under the cover, the steam is allowed to escape, and the temperature regulated by a thermometer placed under the cover—a most valuable means of treating inflammatory affections, and injuries about the throat. He passed a good night, next morning the tube was removed, but after a few hours the respiration became so difficult that it was reintroduced.

Slight symptoms of pneumonia now occurred, but soon passed off; on the fifth day the tube was accidentally removed by the nurse, and the boy breathed well without it for thirty-six hours, but as soon as the opening began to close, dyspnoea occurred, and it was again inserted. While the tube was out the first ring of the trachea could be distinctly seen, divided vertically, as if cut with a knife.

The boy now improved in every respect, except that dyspnoea became urgent the instant the tube was removed. The tube being placed high up in the neck, its position being awkward and keeping the larynx backwards, it was thought probable advantage might accrue by placing it lower down in the trachea. This was done on the 20th of September; a fresh incision being made, it was placed about an inch lower down. No advantage arose from this proceeding; whenever the tube was removed, the dyspnoea came on as quickly and as urgently as before. He left the Hospital for a time on the 12th of November, but presented himself for examination several times during the year 1866, but whenever the tube was removed, and the aperture in the neck closed by the finger, dyspnoea became as urgent as before.

Continued by Mr. Long.—Mr. Pusey having directed my attention to the two cases of successful division of the larynx by Mr. Arthur E. Durham, in Guy's Hospital Reports, vol. 12, p. 540, I, with the concurrence and assistance of my colleagues at the Hospital, Messrs. Stubbs and Bickersteth, performed this operation on the 29th of January, 1867, *i. e.*, about seventeen

months after the accident. This was done under chloroform. The integuments having been divided, a curved probe-pointed bistoury was passed into the opening in the trachea, and the cricoid and thyroid cartilages divided exactly in the median line. The operation was attended with considerable difficulty, in consequence of hæmorrhage, which was arrested by the ligature of a few small vessels; but the great difficulty arose in the administration of the chloroform, which had to be given through the opening, and also from vomiting occurring during its administration.

When the tube was removed, a large fungous granulation, having much the appearance of a polypus, protruded into the opening; it was seized with the forceps and snapped off; the sides of the thyroid cartilage being held apart, an excrescence of a granular form, the size of a split pea, was seen adhering to the right true chorda vocalis; this was also snapped off. Though, doubtless, these growths would to a certain extent impede the passage of the air through the larynx, still I feel sure they were not the sole, or principal cause. I found considerable difficulty in introducing the bistoury upwards through the tracheal opening, the upper part of the trachea shelved downwards, the opening behind being merely a transverse slit. I think, therefore, that the passage of the air through the larynx, when the tube was withdrawn and the external opening closed, was impeded mainly by the parts above this opening being contracted and sloping backwards, owing to the pressure of the convex surface of the tracheal tube. After the operation no sutures were used, and no tube introduced, the parts being allowed to fall together by their own elasticity, and adapt themselves according to their own fashion. The patient was put to bed, and the warm-water apparatus used as before. Nothing worthy of note occurred till February 1st, the third day after the operation. Early in the morning the respiration was difficult, large quantities of semi-purulent matter were coughed up, and evacuated both by the wound and mouth. Mucous râles existed on the left side; dyspnœa became urgent, and the tracheal tube was introduced. On the following day, the respiration being more easy, the tube was removed; from this date he improved rapidly, the wound began to close up, each day more air passed through the larynx and less through the wound, and in ten days

from this date it was noted that, when asleep, the air passed almost entirely through the larynx.

I examined him carefully on the 17th of July. When sitting still, the respiration was perfectly natural; no one would be aware that anything had been the matter with him. When excited, as by running, the air could be heard (at the distance of several yards) passing through the larynx, and producing a rough blowing sound. The same was heard in a less degree when he was quiet, by the application of the stethoscope to the larynx. His voice was quite distinct and toned, but of the character of that of a boy of 14 or 15, when the voice is beginning to break. The skin of the neck was depressed, and slightly adherent to the trachea beneath, but to a certain extent moveable, and obviously loosening. No irregularity could be felt on the larynx or trachea. He enjoyed excellent health, and ran about the streets; his mother said he was a very bad boy, was constantly getting wet, particularly about his feet, but he did not suffer more than other boys from this. He had sometimes, she said, a cough and a bit of cold, but no more than could be expected. I cannot conclude this case without stating that the successful termination of it was mainly due to the constant attention and skill by which it was managed throughout by Mr. Puzey.

In the *Medical Times and Gazette*, New Series, vol. 18, I have recorded a case of Rupture of the Trachea. It is also mentioned in Holmes's *System of Surgery*, vol. 2, p. 286. The outline of the case is as follows:—

A railway labourer, aged 20, whilst connecting two railway carriages, was caught round the neck by the coupling irons. The skin was merely abraded.

The accident occurred on the 24th of October, 1855. It is probable the trachea was not completely torn across at the time of the accident, but that five days afterwards the separation was complete, the lower end of the trachea being on a level with the upper border of the sternum, the larynx, with a small portion of the trachea attached, above. I saw the man on the 26th of June of the following year, and, after describing his state, remarked,—
“I presume, therefore, that a fibrous tube has been developed between the upper and lower ends of the divided trachea.” I am

induced to draw attention thus briefly to the above case, having accidentally met with the man on the platform of the St. Helens Railway on the 27th of September, 1866, nearly eleven years after the accident.

He accosted me (but I had no recollection of him) and told me who he was. The tone of his voice was perfectly natural. He said he was in excellent health, and so he appeared; that he was now a clog-maker, and experienced no ill-effects from his accident; that he was not liable to chest or throat affections. As the train was coming up, and I had little time to spare, I then and there, after he had removed his neckcloth, examined his throat. The larynx, with its small portion of trachea attached, was felt and seen as before at the upper part of the neck, but nothing below. The sterno cleido muscles projected prominently on both sides, but the fibrous tube whereby I had supposed Nature had intended to remedy the accident was gone. When he expired, the integuments between the sterno cleidi were thrown out, so as to form an all but plane surface between them; when he inspired, they sank down, forming a complete gutter from the larynx to the sternum. I could easily, by pressing my finger, feel the spine, but could not detect, either by feeling or sight, any defined lateral boundaries.

On the 11th of July, 1848, a trachea was brought to me by Mr. Stewart, of Messrs. Stewart and Hill, Surgeons, Great Howard Street, Liverpool, with a request from the coroner that I would examine it, and also the body of the woman from whom it was taken, as there were circumstances of a very suspicious nature connected with the case. The circumstances were briefly as follows:—

A sailor paid his addresses to a female, took her to chapel for the purpose of marrying her, but was too late, so the ceremony was not performed. He took her to his lodgings. On his way thither he met a friend, who was somewhat intoxicated. The intended bridegroom was in the same state. At night he went to bed with the woman. His friend sat, or lay, all night at the foot of the bed. About four o'clock in the morning both of them came down stairs. One went to the privy, the other to purchase some rum, saying to the mistress of the house that the female upstairs

was ill. They both shortly went again upstairs, and some little time afterwards summoned the mistress. She went upstairs, but did not see the woman, as her face was covered up. She sent immediately for Mr. Stewart. He arrived at half-past eight a.m., and found the woman dead. This occurred on the 9th of July. Mr. Stewart was told that the deceased had been seized with vomiting and purging, but he saw nothing to indicate the one or the other. The mistress of the house stated very indefinitely before the coroner that she had seen something of the kind. Mr. Stewart knew nothing of the previous history of the case, and had no suspicion that there had been foul play. He found her lying on her back, extremities cold, and body getting cold, rigidity commencing, the arms extended at her sides, face natural, no protrusion of the tongue, in fact, nothing to attract particular notice. He concluded she had been dead about two hours. Some rumours having got abroad, Messrs. Stewart and Hill were requested by the coroner to make a *post-mortem* examination. This was done on the 11th, about fifty-eight hours after death. There was no discoloration of the neck, but the neck was swollen, particularly on the right side, and when pressed upon produced the crepitating feel of emphysema; this extended down to the back, shoulders, and chest of the same side. On making an incision in the mesial line, no extravasation of blood was found amongst the soft parts; on pushing the muscles aside with the handle of the scalpel, a small clot of blood the size of a fourpenny-bit was seen on the right side of the trachea; around this clot was a slight effusion of fluid blood, and the cellular tissue was softer and more easily broken up than elsewhere. On removing the clot an opening into the trachea was found directly under it. On further examination, another opening into the trachea was found, rather more in front. The larynx and trachea were then removed. A considerable amount of frothy fluid was found in the trachea. The lungs were distended with air, but did not protrude when the thorax was opened; they were much congested posteriorly; the right side of the heart was distended with blood, partly fluid, partly coagulated; the left side was also filled with blood, but not distended. The

above is a summary of the evidence given by Mr. Stewart before the coroner.

On the afternoon of the 11th I went down to inspect the body, which had been opened in the morning. The day was excessively hot, decomposition was rapidly advancing, so that I could add nothing to Mr. Stewart's statement, except that we opened the head and found nothing worthy of remark. I also examined the stomach, which had been removed by Mr. Stewart and put into vinegar and water: it contained about a tablespoonful of a sanguineous fluid having no particular odour. There was nothing else to be noticed.

On the following day I carefully examined the trachea. It had been in spirit and water all night. I found the second ring on the right side broken, with absence of a small portion of the ring, thus leaving an opening about four lines long and three wide. The third and fourth rings were broken through perpendicularly near their centres; three or four rings below these were cracked, but not broken through; the fractured rings presented a clean, not a jagged surface; the mucous membrane had, however, a jagged appearance, as if torn; it was of a dark port wine colour, being deepest at the injured parts, and fading gradually in colour as it was more distant from them. The trachea at the injured part resisted pressure when made directly in front, but when the pressure was made obliquely at both sides at once, by the finger and thumb, it gave way, and the parts overlapped each other, producing the impression that the injury had been inflicted by pressure in the direction above indicated. I discovered two slight cuts made by the scalpel in cleaning the larynx, on the forepart of the cricoid cartilage, and a small piece sliced off it on the left side close to the thyroid cartilage. Mr. Stewart informed me he had found, on clearing the soft parts adhering to them, a small bit of cartilage corresponding to the aperture in the first ring.

I tried on the body of a female of about the same age, 26, recently dead, to break the trachea, by making pressure with my thumbs obliquely at the sides of the neck and on the trachea, having my fingers behind the neck. I used all the force I could

exert, and got an assistant to place his thumbs on mine to increase the pressure. On dissection, I found the trachea uninjured.

I tried to fracture the tracheal rings of a lamb (just removed from the body), by forcible compression between the thumbs, but did not succeed; but fractured easily those of a sheep by the same proceeding. The rings did not all break at the same line, but irregularly, the fractured ends, however, were quite smooth, as if cut.

In my evidence before the coroner, I gave it as my opinion, in which Messrs. Stewart and Hill coincided,—that the woman had been strangled, most probably by the hands being placed behind the neck, and the thumb applied at the sides of the trachea; and that, to produce the appearances found in the *post-mortem* examination, the cause could not have occurred after death, the antagonistic action of the air suddenly confined in the trachea being necessary for this purpose; that the appearances could not well be produced by the surgeon in removing the trachea, for the incisions were not near the parts injured; that the clot was seen, and the opening in the second ring found, before the trachea was removed; that the parts were cleaned as much as possible with the handle of the scalpel, and that Mr. Stewart was sure the cuts were made on cleaning the trachea after its removal from the body. I directed attention to the lacerated mucous membrane presenting the appearance of being torn by a force operating from within, viz., by the expulsive effort of expiration. I also pointed to the blood staining at the injured parts. The coroner committed the intended bridegroom for trial on the charge of murder; the grand jury discharged the case, so far as I could understand on the following grounds: 1.—There was no direct evidence, supposing the woman had been murdered, that either or which of the individuals in question had done it. 2.—The rupture of the trachea might have taken place during the act of vomiting. (There was no evidence that she did vomit.) 3.—It might have occurred after death, by the neck falling upon the edge of the coffin. 4.—That the surgeon might have produced the appearances I have described by his careless removal of the parts.

It is probable, various opinions may be formed on this case, but

at this distance of time, nearly twenty years, I feel assured the woman met with a forcible death. I do not say she was intentionally murdered, but forcible compression may have been made on the trachea to prevent her cries, and the trachea ruptured by forcible compression on the one side, and attempts at expiration on the other.

In the *Medico-Chirurgical Review*, No. 75, p. 275, I find "Fractures of the Larynx and Rupture of the Trachea" (*American Journal Medical Science*, April,) relates a case in a man 45 years of age, and refers to twenty-nine other cases.—These I have not had an opportunity of referring to.

ON CROUP.

BY THOMAS INMAN, M.D., LOND.

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WHEN Agassiz and other natural philosophers measured the rate of progress in various glacier streams, they established on the rocky banks some conspicuous mark, which was certain to remain immovable, whilst on the stream itself they placed a line of posts, which, being inserted into the ice, would travel with it. By this means they could not only calculate the average rapidity of flow, but the relative movement of the various parts of the current. As a result of their investigations they found that the progress of glaciers was variable, being sometimes comparatively rapid, and at other times almost arrested altogether.

Now there can be no doubt that the progress of medicine resembles much the forward progress of an icy stream. If we fix our landmark at the time of Hippocrates, and examine how far the stream of therapeutics has advanced since then, we are astonished at the smallness of the onward march. But though the stream for many ages appeared to be congealed, and its flow almost as imperceptible as that of a glacier in a hard winter, yet the summer has come round at last, and the movement of the stream is unusually rapid. The cold chills produced by deference to 'authority' have given place to the genial sun of thoughtful reason.

In nothing is the movement in the therapeutical glacier more conspicuous than in the treatment of croup. To demonstrate this, let us take a survey of the ancient marks. Thirty years ago the disease in question was considered as one of the most formidable to which our children were subjected, and in direct proportion to the fears which it excited was the activity of the doctor to counteract the complaint. As a student he had been taught to recognise

the disease by its symptoms, and when once the formidable enemy was identified, he was instructed to attack it with antimonial emetics, with local bleeding by leeches or by opening the external jugular vein, by blisters or sinapisms, and by the free use of mercury. If the practitioner inquired into the rationale of the treatment, he was told that croup was an inflammation of the larynx and trachea, whose progress was peculiar; that a tenacious leathery substance was produced by the mucous membrane instead of the usual secretion; that this materially interfered with the calibre of the wind-pipe, and thus gave rise to gradual suffocation and death by apnoea. As the onset of the disease was sudden, so must the medication be prompt; and as blood-letting, antimony, and mercury were the most valiant combatants against 'inflammation,' they must be used with decision and energy.

But each physician in his turn found that his soldiers were by no means as worthy as he had supposed; they were indeed like elephants in battle, more fatal to their friends than to their enemies, yet for want of better warriors they were retained and trusted. After a certain lapse of time, however, another was added to them, and they were supplemented by tracheotomy, which, like the reserve of an army, was brought up when the other troops had failed. The new ally was, however, little better than the rest, and the mortality from croup remained almost unchanged. Yet, notwithstanding the defection of all these right-hand men, they were still trusted by the many, and are yet considered by some as the only remedial agents worth employing.

But in an age of progress, when the minds of all educated men are seething with thought, it is impossible for medicine to content itself with defeats, and call them victories. The constancy therefore with which it was beaten in its fight with croup obliged it to quit the field or change its tactics. 'Authority' having failed, reason was appealed to, and thus it was she spoke. Granting that the disease is a local inflammation, what does it do? does it not implicate the muscles of the larynx, and thus make them prone to irregular action, i. e., to cramp or spasm? and have we not practically in 'laryngismus stridulus' a proof that one at least of the symptoms of croup is of purely muscular origin? Again, as the

inflammation produces a secretion which necessarily diminishes the area of the trachea, is it not certain that the patient will require an increased respiratory power to make the necessary amount of air pass through it? Is it not certain that if with a decreased aperture there is also decreased breathing power, the aeration of the blood will be deficient? And if the aeration of the blood be impeded, does not physiology teach us that the lungs become congested? Again, does not pathology teach that congestion of the lungs is found in those who die of croup; even after tracheotomy has been performed? After these preliminaries, is it not clear that every effort is to be made to keep up the respiratory power; and that every thing is to be avoided which would diminish it? Now we know that antimony and mercury and blood-letting do materially diminish the breathing faculties, consequently they are to be deprecated. These things, then, do positive harm in one sense. Does experience demonstrate that they have ever done good in croup, either by diminishing muscular spasm or reducing inflammatory action? Not only are they useless in so doing, but they seem positively to increase the evil. The most rapidly fatal cases are those in which these means are most freely used, and those who have abandoned the use of the means indicated never now meet with that severity of symptoms which appalled their predecessors. Here, as in many other instances, the very weapons with which the physician hoped to bring aid and to save life were in themselves lethal, and frequently the passports to eternity. Having then discarded our old plan of warfare, we proceed to study new tactics.

The first step is to reconnoitre our adversary's position. We find that croup in the child is produced by the same causes as bring about catarrh in the adult; they have, therefore, something in common. Now catarrhal inflammation is comparatively fugitive; we can recognise this readily when it affects the conjunctiva; but it is persistent in direct proportion to the amount of cachexia in the patient. It is probable, therefore, if the sufferer be in tolerable condition generally, that the croupy symptoms will abate spontaneously, just as does the sneezing or coryza which precedes a cold. That they do so I know from positive experience, and in less than twenty-four hours.

We next observe that (constitutional conditions being for the time ignored) the same causes which induce a fit of 'laryngismus stridulus' produce a croupy paroxysm; hence it is clear that some of the symptoms are due to purely local causes.

Again; we observe that one of the most common causes of croup is prolonged exposure to a cold atmosphere, where the wind is blowing directly upon the face; from which we infer that the inflammatory condition is one of reaction, and that it will not be benefited by ice. When we seek for a type of inflammation which is consequent upon a previous exposure to cold, we find it in a common chilblain, and in that phenomenon known to boys as "the hot ache." This inflammation is sometimes very intense, sufficiently so to produce gangrene. Where the type of any inflammation is necessarily asthenic, it is undesirable to bring about asthenia generally. Such an inflammation is croup.

This reconnoitring enables us to know the enemy's tactics when he makes an onslaught. Our first impulse is to examine whether the attack may not be a feint altogether, a simple incursion, to be followed by a speedy retreat. Dropping, however, our metaphor, let us consider the indications of treatment which we deduce from the preceding considerations. 1.—In slight cases no medicaments are necessary; hot moist air and local warmth suffice; talking and laughing are to be deprecated so long as the laryngeal muscles are irritable; fever may be subdued by the free use of oil to the skin. 2.—In more severe cases an emetic of ipecacuan will relax the arid mucous membrane, and thus put an end to that distressing dry stage with which we who suffer from catarrh are so familiar. 3.—To reduce the irritability of the laryngeal muscles opiates may be used, both locally and generally. 4.—We must next endeavour to remove, as far as possible, every irritant from the sensitive spot; and to effect this every breath which is inhaled should be of the temperature of the body, and moist as is the human breath. 5.—Such symptoms as thirst and feverishness may be met by any drink the patient selects; it is certain that under such circumstances a child will neither select spirits, wine or ale. 6.—The occasional inhalation of chloroform may be adopted, if the patient when first seen is in very low condition.

Dr. Eastman informs us (*Ranking's Abstract*, vol. 81, p. 87) that in his practice he has found that croup is more amenable to treatment by quinine than by any other means, and he tells us that he has had some hundreds of cases thus treated without a single death. As an ipecacuan emetic often cuts short an attack of ague, it is possible that its value in croup is due to its action resembling that of quinine.

That the views above are sound I have had frequent opportunities in private practice for observing. Instead, however, of reproducing any of them, I prefer to record one which, though it occurred amongst my patients at the Royal Infirmary, was treated entirely by our house-surgeon, Mr. Chauncy Puzey. A child, about four years of age, was admitted into No. 15 ward, who had so severe an attack of croup that Mr. Puzey's first impulse was to tracheotomise it, so as to avert instant death; but before doing so he prepared an apparatus similar to that generally adopted after the operation has been performed, and resolved to try its effects before, rather than after the operation. The apparatus resembles an ordinary baby's cot, the hood covering the upper part of the body, and effectually preventing draughts of cold air. A kettle of boiling water is then placed upon the fire, and a tube from the spout introduced under the hood, so as to secure warmth and moisture beneath it. Into the place thus prepared, and everything about it being warmed, the patient was introduced; no medicine was given, and the diet was according to the child's fancy. The symptoms immediately began to abate, and in twelve hours the patient was out of danger. On two other occasions Mr. Puzey has had similar success.

Shortly after this occurrence I had an opportunity of conversing with my friend, Mr. Parker, the very able surgeon to the Industrial Schools at Kirkdale, on the subject of croup, and the contrast between the present and the past method of treating it, telling him of the case above recorded. His answer was to the effect that for many years past he and the nurses at the Schools thought nothing of croup. The nurse, on discovering its presence, administered an emetic, and used the hot-air apparatus, which was so completely successful that he was himself scarcely ever sum-

moned to see a case. Thus, in a large establishment of boys, and those not of the most robust constitution, croup has, under the new *régime*, become less formidable than measles, and medicine has removed a blot from her escutcheon, and fairly asserted her claim to progress.

When once we satisfy ourselves that the science of therapeutics has advanced with the age, it is allowable for us to look round and consider whence the improvement sprang. We shall then be in a position to know in what direction to look for more. Now, so far as I can judge, some of the Metropolitan Schools can fairly lay claim to be the leaders of the movement. London can boast of two such men as Dr. T. K. Chambers and Dr. B. W. Richardson, and Edinburgh produces Dr. J. H. Bennett; all of whom have given an amazing impetus to the science of therapeutics; all these are original observers, rather than copyists of former writers, and we incline to the consideration that the advance of real medical science has been due to the development of independent thought amongst the general practitioners, who have at length been taught that it is incumbent upon a doctor to cure his patient if possible, rather than to treat him according to the rules of his art.

So long as there was a supposed orthodoxy in medicine, our art slumbered as profoundly as did once our National Church; but as the latter was roused by the fierce energy of Wesley, Whitfield, and Rowland Hill, and is still further stimulated by the independent inquiries instituted amongst her own people and by strangers, so has medicine been spurred onwards by the sharp stings of opposition; each individual doctor now does his best, irrespective of an orthodox school, and thus helps on the march of knowledge. We hail, therefore, opposition as the best friend of progress, and to it we look for continuous success.

**DEPOSIT OF STRUMOUS MATTER WITHIN THE
GLOBE OF THE EYE, SIMULATING MALIGNANT
FUNGUS, WITH REMARKS.**

By R. HIBBERT TAYLOR, M.D.,

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FANNY T., aged 15, was admitted an in-patient at the Eye and Ear Infirmary, April 22nd, 1867. She was of medium height, and spare habit, with pale complexion, and rather delicate aspect, her general health had been fair, but never robust.

About four months previous to admission, she became subject to pain over the left eyebrow, of a dull heavy character, nearly constant, and worse at night, and on lying down. During three weeks earlier she had observed that all objects looked at seemed smaller than usual. Vision with the left eye had declined gradually, and for a month past had been, as on admission, absolutely null. The pupil was dilated about one-third beyond its normal size, and was fixed, but regular. The globe was enlarged towards the outer and lower side, in the form of two rounded elevations, about the size of large peas, which were overspread with vascularity; there was no pain on pressure, but the eyeball felt firmer to the touch than natural. On looking into the pupil an opacity was visible behind it, apparently in the situation of the posterior capsule of the lens; it presented an opaline tint in some positions of the eyeball, but when the globe was rolled sinistrad, it assumed a yellowish wash-leather hue, the surface exhibiting a metallic lustre, with red vessels running over it. This opacity presented the appearance of a new growth, and seemed to be of soft consistence. She had not suffered from photopsia or muscæ at any time, but at night was disturbed by pain; the appetite had fallen

off, and the pulse was feeble. The right eye was sound, but its functions were impaired by sympathy with the other.

She stated that she had been brought up in the country, but a year ago had removed to a neighbouring town, where she resided with a relative who kept a butcher's shop, and there she had been in the habit of sitting up late at night by gas-light.

My impression, after examination of this case, was that I had to do with a malignant disease, probably fungus, which was advancing towards the cornea. It was seen and examined by one of my colleagues at the Infirmary, and by the assistant surgeon, who both came to the same conclusion.

The day after this patient was admitted into the Infirmary, I observed that the swelling on the outer side of the eyeball had enlarged considerably, and assumed a somewhat pointed form; the following day this was still more marked, and, at the suggestion of another of my colleagues, it was resolved to make an exploratory puncture with a broad needle.

The swelling was punctured at its most prominent point, and a large quantity of healthy-looking pus escaped, tinged towards the end with a little vitreous humour. The patient slept better the following night, and was almost entirely relieved from the headache which she had previous to the operation. On examining the eye the following day, the swelling of the globe was found to be much diminished in size, and on looking into the pupil, the opaque substance formerly visible had evidently retreated much further back, and no longer presented the same yellowish metallic appearance. From this time the patient continued to improve, the pupil regained a certain amount of motion, and she was able to distinguish her hand. At a later period vision still further improved, so that she was able to count her fingers, and also to distinguish the white colour of my shirt front and a watch chain, as I stood before her facing the light. After this the eye continued much the same, but as her general health rather declined, it was thought desirable that she should return to the country. She therefore left the Infirmary on May 7th, having been an in-patient for about a fortnight.

On May 26th she was re-admitted, stating that she had again

become subject to pain of the eye and head soon after returning home, and which had continued more or less ever since. She had fallen off in health and strength during her absence in the country, and a prominent cone-shaped eminence had again developed itself on the lower and outer side of the eyeball, but firmer in consistence than on the last occasion. Vision was now completely abolished, but the pupil was still regular and clear, though fixed. The tumour was again opened, by a pretty deep incision into its substance, but no matter escaped. The symptoms were not much relieved, the pain still continuing, and subsequently a considerable quantity of matter was discharged from the wound on several occasions. The globe continued to enlarge, and became more vascular and painful, and blood was effused into the anterior chamber; the patient's rest was disturbed, and her appetite and strength failed rapidly. In these circumstances, it was obvious that no alternative remained but to extirpate the eyeball, which was accordingly done, the patient having been previously brought under the influence of chloroform. Before removing the globe, a deep incision was made into the tumour, giving vent to a small quantity of straw-coloured fluid and degenerated vitreous humour. The extirpation was accomplished without difficulty. On making a vertical section of the globe, after its removal, a thick layer of curdy-looking strumous matter was found to be interposed between the inner surface of the sclerotica and the more internal tissues, the choroid and retina being pushed towards the centre, and the vitreous humour much diminished in quantity and disorganised. The lens still remained *in situ*, and retained its transparency, but was reduced in size. The operation was followed by immediate relief to all the constitutional symptoms, the patient rapidly improved in all respects, and left the Infirmary again on the 17th of June.

Two circumstances appear to me worthy of note in this case. 1.—The close resemblance which certain of the appearances presented to those of malignant fungus in its early stage. I do not enter upon the debatable question, whether this was in any sense a malignant form of disease; it certainly was not a case of fungus hæmatodes, which I at first supposed it to be. Acting

upon this supposition, I had resolved to extirpate the globe at once, but the rapid alteration in the external appearance of the eyeball, and the result of the exploratory puncture, awakened a feeling of satisfaction that I had not carried this resolution into effect. The further progress of the case, however, showed that extirpation in the first instance would have been the wiser course after all; but we live to learn, and our errors in diagnosis, if rightly considered, may prove more serviceable to us than our more truthful discriminations. 2.—I would remark the immediate and permanent relief afforded by the removal of the globe. There is every probability that, if left to itself, the irritation and exhaustion induced by the disease would have terminated this girl's life; as it was, she had no sooner recovered from the effects of the chloroform administered previous to the operation than, to use an old but expressive phrase, "she never once looked behind her." She slept well, regained her appetite and spirits, and seemed in every respect a new creature.

I may mention, in conclusion, that I have seen her several times since she left the Infirmary as an in-patient. The last occasion, August 14. She was then in her usual health, and will shortly be able, if she chooses, to wear an artificial eye.

ON WATER AND ITS IMPURITIES.

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It will scarcely be necessary to apologise for the subject of this article, although it is one which has been often discussed, both in scientific circles and by the general public. The mind of the nation seems to have been of late awakened to the great importance of a sufficient supply of pure water, and to the fact of disease and death arising from the pollutions so commonly to be found in that which is in many cases still supplied. The outbreak of cholera last year repeated the lesson of previous visitations, and it will be well if this lesson be not lost upon the community, or forgotten until it be repeated, as it most certainly will be if neglected. I do not, however, propose to limit the discussion of water impurities to those forms alone which are supposed to lead to the spread of epidemics; I prefer to include all the commonly occurring varieties, as the present seems to be a favourable time for reviewing the knowledge we already possess respecting them.

In chemical language, any substance dissolved or suspended in water;—any material, whether solid, liquid, or gaseous, which is found in addition to its chemically combined oxygen and hydrogen, constitutes an impurity. In this sense an impurity is not necessarily *injurious*. Some are perfectly harmless, or even, in certain cases, beneficial; others are doubtful; some are certainly noxious. Chemically pure water is seldom or never found in nature; probably the nearest approach to it exists in rain-water after long continued

rains, but even this contains impurities, principally gaseous, derived from the atmosphere.

The same substances will be found in much greater proportion at the termination of a long dry season. Various soluble gases are contained in the atmosphere, whether naturally present, as oxygen, nitrogen, and carbonic acid gas, or resulting from various chemical actions of decomposition or oxidation, proceeding on or above the surface of the earth, as ammonia, and the vapours of nitrous and nitric acids. Rain water accordingly is found to contain ammonia, nitrite of ammonia, and nitrate of ammonia, together with small amounts of the gases first mentioned. In large towns various substances of organic origin are present in the atmosphere; but most of these are gradually oxidised and converted into harmless compounds. Again; into the atmosphere of colliery districts, notably where there are coke-ovens, as well as into that of towns, a large amount of sulphurous acid gas is constantly being poured; this gas is quickly converted, by oxidation, into sulphuric acid. Rain water in these localities will contain sulphate of ammonia, and probably at times free sulphuric acid. I have found abundant evidence of this in the rain water of Wigan. None of these impurities can be considered of any moment; their proportionate amount is very small, and, even were it larger, there is no reason to suppose they would be injurious. The peculiar taste of rain water is sometimes ascribed to the absence of the substances commonly met with in solution in spring water; but there can be little doubt it arises from atmospheric impurity, and it may be removed by an ordinary filter. In country districts the rain water will almost certainly act upon lead, and if it be collected from a leaden roof, or stored in a leaden cistern, it will become contaminated with that metal. In large towns, according to Miller, the rain water is generally so impure as not to have this action; yet the rain water of Wigan, already mentioned, has strong action upon lead.

Filtered rain water free from lead may be regarded as the safest, and on the whole the most to be recommended form in which water can be obtained for drinking and cooking.

On soaking into the ground, the water which has fallen as rain dissolves whatever soluble matters the soil and rocks may contain; and thus we obtain the various descriptions of spring and river water. The impurities present may be of organic, or of mineral origin. There will always be more or less soluble matter derived from that portion of the soil which is of vegetable origin. If this be in large amount the water will have a dark tinge, as was the case with the Rivington water when first brought to Liverpool. But organic matters exposed to the influence of oxygen, especially when in a state of fine division, gradually become oxidised; and this action is constantly taking place in water containing it. The products of oxidation consist almost entirely of carbonic acid and water. A portion of the carbonic acid remains in solution; the rest, coming off in minute bubbles, gives to spring water its well known sparkling character. Such carbonated water has a much greater solvent action upon many mineral substances, particularly the carbonates of lime, magnesia, and iron, than pure water has. The two first of these are accordingly amongst the commonest impurities of natural waters, and the last is very frequently present, though usually in small proportion.

The nature of the mineral impurities of spring and well water will depend on the composition of the soil and rocks, with which it has been in contact. Thus in the case of hard slaty or gritty rocks, such as are common in the older geological formations, and in the hilly parts of the country, there is very little capable of being readily dissolved, and the natural waters of such districts usually contain but a very small proportion of mineral matter. On the other hand, in calcareous districts, as in those of the Carboniferous Limestone, and in the chalk districts of England, a considerable amount of lime, chiefly as carbonate, is found in the water of springs; accompanied by carbonate of magnesia in smaller proportion, and by the sulphates of lime and magnesia. The other commonly occurring mineral impurities are chloride of sodium, and silica; the latter usually in very small proportion. The following analysis, which I have lately made of a spring water from Cumberland, will serve as an example; it may be regarded as a water of very fair quality.

	Grains per Gallon.
Carbonate of lime	2·10
Carbonate of magnesia	1·62
Sulphate of lime	1·77
Chloride of sodium	1·11
Chloride of calcium	0·12
Silica and oxide of iron	0·21
Nitrites (a trace)	
Loss	0·38
Total fixed or inorganic solids	7·31
Organic and volatile matter	0·87
Total solid matter	<u>8·18</u>
Hardness	<u>4°·9</u>

The following is an analysis of the Rivington water, made a few years since by my predecessor, Dr. J. B. Edwards.*

	Grains per Gallon.
Carbonates of lime and magnesia	1·01
Sulphate of lime	2·30
Chloride of sodium	1·90
Silica	0·20
Oxide of iron (a trace)	
Organic matter	2·06
Total	<u>7·47</u>

The composition of river-water will of course resemble that of the springs from which it is chiefly derived. By contact with the atmosphere, however, and by the agitation of motion, much of the excess of carbonic acid contained in the latter escapes; and a corresponding amount of earthly carbonates becomes separated and deposited. Thus "the calcareous springs in the chalk districts around London contain from 18 to 20 grains of chalk per gallon; six or eight grains of which become separated by exposure of the water to the atmosphere, so that a running stream will seldom

* "An inquiry into the properties of the Rivington water, by J. B. Nevins, M.D., and J. B. Edwards, Ph.D., F.C.S."

contain more than twelve or fourteen grains of chalk per gallon in solution."—[MILLER.]

In connection with the recent schemes for supplying water to London, Liverpool, and other large towns, it will be interesting to note the composition of certain lake waters, according to the analyses of Professor Way.

	Grains per Gallon.		
	Haweswater.	Ullswater.	Thirlmere.
Carbonate of lime	0·90	1·45	0·75
Carbonate of magnesia	0·36	0·42	0·29
Carbonate of soda	0·56	0·40	0·20
Sulphate of soda	0·90	0·65	0·78
Chlorides of sodium and potassium	0·40	0·69	0·77
Oxide of iron, silica, &c.	0·25	0·20	0·05
Organic matter	0·62	0·35	0·77
Total solid matter	<u>3·99</u>	<u>4·16</u>	<u>3·61</u>
Hardness before boiling	2°0	2°1	1°5
Hardness after boiling	<u>1°8</u>	<u>2°1</u>	<u>1°5</u>

Professor Way's opinion of these waters is that any one of them, or a mixture of them, would be admirably suited for the domestic supply of town populations, whether large or small.

A class of impurities must now be considered, which are of the greatest importance in reference to questions of health; those, namely, which are of organic origin. Thus, surface drainage water will contain some of the soluble organic matter, chiefly vegetable, derived from the soil; if it flows over cultivated land, it may be further contaminated by animal matter from manure; and finally, in innumerable cases, the products of human and animal excretion find their way into it, either on the small scale, as with town, village, and farm wells, or wholesale, as where the sewage of a town is poured into a stream. The subsequent history of these organic impurities is instructive. Chemically they may be arranged under two heads—the non-nitrogenous and the nitrogenous. As all organic beings contain nitrogen, it is evident that this element must be found amongst their products of decay, as well of vegetables as of animals. But the former contain a comparatively very small amount, hence much the larger proportion of the vegetable

organic matter will consist of substances composed of carbon, hydrogen, and oxygen only. On the other hand, that which is of animal origin will be distinguished by its containing a large amount of nitrogen united with these same three elements. There will also be a little nitrogenous matter of vegetable origin. With regard to properties, however, no distinction can be drawn between nitrogenous matter of animal and that of vegetable origin. Whatever its source, it is always characterised by its chemical instability. Azotised compounds, when no longer under the influence of life, if in presence of moisture, immediately begin to undergo changes, splitting gradually into less and less complex compounds, and finally becoming oxidised, and thus in a sense destroyed. The change will be the more rapid in proportion to the fineness of division of the material; notably therefore when in solution or suspension in water. Of the elements constituting the azotised matter, the carbon will ultimately become carbonic acid gas, and the hydrogen will form water. The same thing will occur to the carbon and hydrogen of non-azotised matter. The nitrogen, the peculiar element of the former of these classes of substances, will be first converted, mainly, into ammonia; by further change of oxidation, all the nitrogen will pass into the state of nitrous or nitric acid, which, by acting on the carbonates present, will appear in solution in the form of nitrites and nitrates respectively.

At a certain stage, then, we shall find in the water an amount of unchanged or partially changed nitrogenous organic matter, together with ammonia, nitrites, and nitrates, the products derived from impurities previously present. Such will be the character, for example, of a well water fed by farmyard in-drainage, and of a river water just below the point where it receives town sewage. If we follow the latter in its downward course, we shall find that first the unchanged or partially-changed nitrogenous organic matter will cease to be detected, then the ammonia will more or less disappear, until finally the only evidence of the previous contamination of the water, by the substances I have referred to, will be the nitrites and nitrates still present (these latter remaining permanently), with or without traces of ammonia.

It has been stated that the bulk of vegetable organic matter is

composed of substances formed of carbon, hydrogen, and oxygen. Such substances are, as a rule, less liable to change than those which also contain nitrogen; yet when in contact with nitrogenous matter in a state of change, the chemical action is communicated to the non-azotised matters, which are thus rendered as unstable as the rest. Under the circumstances which have been described, where water takes up vegetable matter, such contact is inevitable. The result is the slow decomposition and ultimate oxidation of the whole of the organic impurity present in the water.

We must return for a few moments to the consideration of an impurity already mentioned, namely, lead. Spring and river waters act very differently upon this metal, according to their composition. As a rule, the softer the water the greater is its power of dissolving lead. The action is also favoured by the presence of chlorides or nitrates. Dr. Nevins has shown that the presence of solder in a leaden cistern favours the solution of the metal, by establishing a galvanic current. Hence, cisterns which are made by "autonomous soldering" are to be preferred, if lead must be used at all. In the experiments performed by Drs. Nevins and Edwards (described in the pamphlet already named), they found that Rivington water was acted on by lead in all cases, the metal becoming dissolved. My own observations have shown the same thing. It is highly desirable, therefore, that Liverpool water should not be stored in leaden cisterns.

We may next inquire briefly into the character and effects of the various classes of water impurity. As to mineral matters, it will not be necessary to consider any but the compounds of lime and magnesia. These are the ingredients to which, almost entirely, the *hardness* of water is to be ascribed, this quality being recognised by the action of such water upon soap. When soap is used with hard water, its organic acids unite with the lime and magnesia present, forming insoluble curdy-looking compounds. Until the whole of these bases has been so combined, the soap can exert no cleansing power, and is therefore destroyed without equivalent. The late Dr. Clark devised a method of indicating the amount of hardness in waters, which is now almost

universally employed. Each degree of hardness represents one grain per gallon of carbonate of lime, or its equivalent amount of other hardening ingredient in solution. Thus water of 10° of hardness contains either ten grains of carbonate of lime in the gallon, or such an amount of hardening material, of whatever nature, as will destroy as much soap as the ten grains of carbonate of lime. After prolonged boiling, the hardness of water is usually lessened, the difference representing approximately the amount of earthy carbonates originally present held in solution by carbonic acid. The permanent hardness is chiefly due to earthy sulphates.

Some have suggested that the presence of lime in potable water is desirable as an article of diet, to supply the waste of the tissues containing it. But the hard tissues change very slowly, and there seems to be quite a sufficiency of lime in ordinary articles of food to supply their waste. On the other hand, there is no reason to suppose that hard water is injurious; nor am I aware of any facts which support the popular notion that it is liable to produce calculous disorders. Still, from considerations of cleanliness, there can be no doubt that water supplied to towns should be as soft as possible. The hardness of several lake waters has been given. That of Bala Lake (which contains 2·08 grains of solid matter per gallon) is 0°·8. That of Loch Katrine is 0°·2. That of the Thames, as supplied by the Metropolitan Water Companies, is about 13°. The water supplied to London by the Kent Company is as high as 16°. The hardness of the Liverpool water varies, I believe, according to the proportions in which the Rivington and well waters are mixed. On July 12th I found it to be 4°·6, as supplied to the laboratory of the School of Medicine.

It is difficult, from the absence of rigidly ascertained facts, to speak definitely of the effects produced by organic matter in water, yet there are some conclusions which may be drawn with safety. Many observations unite in proving that nitrogenous organic matter in a state of decomposition is injurious. This has often been shown in the case of solid articles of food, which in particular stages of decay frequently give rise to symptoms

of irritant poisoning. But, what is more to the purpose, the habitual use of decomposing food, as in case of the "rast" of the Faröese, produces very considerable derangement of the digestive system, and, most important, a *strong constitutional tendency to the contraction of zymotic diseases*. [See Dr. Carpenter's *Human Physiology*, 6th ed., p. 48.] Many cases have occurred which teach us that similar matter present in drinking water produces exactly the same effects; and it is universally felt that one of the most important aids in the prevention of epidemics is a plentiful supply of pure water. With regard to cholera, it is certain that the draining of sewage into well water is a most potent cause of the spread of that disease. [For cases, see Dr. Frankland's paper on "Water Supply and the Cholera," in the *Quarterly Journal of Science*, July, 1867; also Dr. Lankester's Reports on Public Health, in the same periodical. See also Dr. Frankland's lecture on Water, delivered at the Royal Institution, and fully reported in the *Laboratory of June 1st*.]

With regard to the non-nitrogenous organic impurities of water, it is generally assumed that they are either less injurious than the former class, or that they are positively innocuous. In the absence of known facts, it is impossible to state the value of this opinion. That such matters are less objectionable than nitrogenous is most probable; that they are quite harmless is most doubtful. On the whole, it is safest to look with suspicion, or to reject, water which analysis shows to contain a notable quantity of organic matter of whatever kind, and particularly if nitrates are present; as these, though harmless in themselves, point to nitrogenous contamination. Any attempt to fix a definite amount must be more or less arbitrary; but if we condemn all waters which contain more than *two* grains of organic matter per gallon, we shall scarcely be erring very far on the side of safety. Before mentioning the composition of certain specimens, it is desirable to say a word on the method of analysis. The total solid impurity is ascertained by evaporating a known quantity to dryness, after addition of a known weight of carbonate of soda (to prevent loss by the decomposition of

chlorides), and keeping the residue for a time at a temperature of about 260° F. It is then ignited, carbonic acid (in solution, or as carbonate of ammonia) added, to reconvert any decomposed carbonates, and the whole again gently heated. The difference between the weights before ignition and at the close represents the volatile matter. This consists almost entirely of organic matter, which may, however, be accompanied by the volatile constituents of nitrites and nitrates, and by some water which has been strongly combined. The result, therefore, represents the state of the water as to organic matters not quite accurately, but approximately. A few instances will now be instructive. The water supplied to the metropolis by Thames companies in September, 1866, contained volatile matter varying from 0·76 to 1·00 grains per gallon. During the late outbreak of cholera, specimens of water from five wells, extensively used in and near Wigan, were examined by Dr. Angus Smith, who found respectively 20·23, 5·89, 2·02, 5·42, and 2·06 grains of organic matter per gallon. All the five contained nitrates, the first two in immense quantity. Shortly afterwards I examined the waters of ten wells used in Hindley and Ince, where also cholera made great ravages. The organic and volatile matter amounted respectively to 9·24, 10·05, 9·88, 11·55, 8·09, 6·52, 4·37, 4·93, 7·18, and 11·75 grains per gallon. All except one contained nitrates. It is not easy to conceive a worse state of things, for in those townships the wells form the sole sources of water supply.

It has long been felt that the method of analysis already described was far from giving a clear account of the condition of a water as to its organic impurities. Dr. Frankland has lately adapted a much improved system with regard to the metropolitan waters. He estimates the total amount of combined nitrogen, the amount present in the form of nitrates and nitrites, and the ammonia. On an average, the amount of combined nitrogen is about 0·4 parts in 100,000. The oxidised nitrogen corresponds to a previous sewage contamination of about 2,500 parts in 100,000 (as calculated from a comparison of average filtered London sewage). There is no appreciable difference

between the total nitrogen and the oxidised nitrogen, showing that before the water is delivered the nitrogenous organic matter has become thoroughly oxidised, and thus rendered harmless. The water of Loch Katrine contains 0.04 in 100,000 of combined nitrogen.

On the other hand, Messrs. J. A. Wanklyn, E. T. Chapman, and M. H. Smith, of the London Institution, condemning Dr. Frankland's system of analysis as untrustworthy, have adopted another. They estimate the free ammonia present in the water, and afterwards convert the combined nitrogen into ammonia by distillation with various oxidising agents. The conclusions they have arrived at from various analyses are, briefly, that the water of deep springs is best adapted for town supply, and that derived from rivers and lakes is objectionable as containing too much "albuminoid" nitrogen. Mr. R. H. Smith, after examining the water of Bala Lake by this method, condemns it as being organically as bad as Thames water. The authors of the method have also condemned the water of Loch Katrine. The system, however, is as yet in its infancy, and this will induce considerable hesitation in accepting these conclusions, so different from the opinions generally held by chemists. Many chemists have endeavoured to compare the organic contamination of waters by the use of permanganate of potassium. Dr. Frankland, however, has conclusively shown that no reliance can be placed upon this method of estimation.

It will be unnecessary here to speak of the various schemes which are afloat for supplying London and other towns with pure water. There remain to be considered innumerable small towns and villages, which are not taken account of in any of the schemes. I would observe here, that since water which is to be used for drinking and cooking must possess qualities which are not required in that intended for other purposes, it is not necessary that the whole of the water supplied should be pure, but simply that required as stated. And although for large towns it may be more feasible to have a single than a double service, in other cases the latter may be preferable. I have already stated the advantage of using filtered rain water stored in slate cisterns

or wooden tubs. A cheap filter, within the means of the working classes, is much to be desired. Perhaps a large flower-pot containing animal charcoal (or the magnetic compound described in the *Lancet* of July 6th), sand, and pebbles, would make a fair substitute. With regard to filters in general, late experiments by Mr. Byrne show that the purifying power of a new filter is no criterion of its permanent value. It is essential, before deciding upon its merits, to examine its action after a large quantity of water has passed through it.

When a supply of bad water is inevitable, and filters are too expensive, it is important to have a ready means of to some extent neutralising or destroying the noxious ingredients. The best seems to be the employment of the alkaline permanganates, such as "Condy's fluid." Supposing the drinking water is kept in a white vessel (if in a dark one, a white plate may lie at the bottom), the fluid is added, with stirring, until the whole acquires a faint pink tinge, as seen against the white surface. In a few moments this will usually have disappeared. The treatment should be repeated two or three times a day, and as often as fresh water is added. In this case the permanganate seeks out and oxidises just that portion of the organic matter which is most objectionable; that, namely, which is most rapidly decomposing and ready for oxidation. But, after all, such expedients are only, like the miner's safety lamp, of use in temporarily enabling the owner to find a place of safety—a sufficient supply of pure, uncontaminated water.

DESCRIPTION OF A CASE OF TRUE HERMAPHRODITISM, WITH REMARKS.

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THE subject of this malformation was admitted as a female into the Royal Infirmary, under the care of Mr. Bickersteth, April 18th, 1867. She gave her name as Mary W., and stated that her age was 39, but she looked much older. She earned her livelihood as a street hawker. She was tolerably stout and thick set, and rather tall for a woman. The complaint for which she was admitted was that of dry gangrene of the right foot, the toes and part of the heel being in a state of sphacelus; there was also ulceration of the leg. As soon as her bonnet was removed, it was noticed that she had been in the habit of shaving, for about a day's growth of what would have made a tolerably thick beard was at once obvious. Her voice was deep-toned, and decidedly masculine in character.

Some suspicion being entertained as to her true sex, she was ordered into a bath, much against her will, and it was then discovered that she was a hermaphrodite. The gangrene of the foot and the ulceration of the leg seemed to be progressing favourably, till the night of the 21st, when, without any known cause, she was seized with a severe attack of purging, followed by obstinate bilious vomiting, which continued without any improvement until the morning of the 24th, when she died with symptoms of collapse. During her illness she never complained of any pain or tenderness over the abdominal region. It was accidentally discovered by the nurse that she had brought a razor in her pocket. While an inmate of the Hospital she was very quiet and taciturn, never speaking unless spoken to, and unfortunately, in consequence of

her unlooked-for death, no questions as to the sexual feelings were put to her, except as to the menstrual function, to which she replied that she had every month a slight coloured discharge. She was retired and solitary in her habits, always sleeping in a room by herself. For the foregoing particulars of her case, I am indebted to the courtesy of Mr. Puzey, the House Surgeon.

On the post-mortem examination several patches of ulceration were found, in the lower portion of the ileum and in the commencement of the colon; they seemed to be of recent origin, there being no cicatrices visible. One had passed on to perforation, which, by producing peritonitis, was the cause of death. The aorta and the arterial system was the subject of advanced calcareous degeneration. The accumulation of adipose tissue in the abdomen was excessive.

Description of the Body.—The body was covered by a thick layer of subcutaneous fat. The forehead was broad and smooth, and the eyebrows were not strongly marked. The hair of the head had been worn long like a woman's, and was somewhat grey. On the cheeks, upper lip, and chin, was a greyish stubble, and if the hair had been allowed to grow on these parts, a very fair moustache and beard would have resulted. The nose was small and well proportioned, the ears were also small, and pierced for ear-rings; the neck was short and thick; the shoulders were broad and square set; the chest was large, and the abdomen corpulent. The general contour of the trunk was decidedly masculine, and disproportionately large to the extremities, which were small and feminine in character. The pelvis appeared to be somewhat wider than in a well formed man. The mammary glands and nipples were entirely undeveloped. The skin of the trunk and extremities was fair and smooth, and singularly deficient in hairy growth.

Description of the external parts of generation.—The mons veneris was large and prominent, and but sparsely covered with hair. Below it, was a distinct penis measuring, without stretching, two inches in length, and upwards of two inches in circumference. The organ possessed a very perfect glans, except that it was imperforate; and it had also an ample prepuce, which was retracted

behind the glans. The dorsal aspect of the penis had a most natural appearance, but its under surface was very imperfectly developed, being only covered by mucous membrane. The corpus spongiosum was altogether absent, and in its place ran a groove, representing the normal urethra, from the glans for two-thirds of an inch backwards. The prepuce was attached on the under surface of the organ along the margins of the urethral groove, and then passed downwards, as a strong fold or frænum, to the orifice of the urethra, which was situated between the labia, very much as in the normal female parts. By this band the penis was tied down, so that erection, properly speaking, must have been impossible. The skin folded on each side of the root of the penis, to form labia majora. These labia in some respects resembled the ununited scrotum of the hypospadiac male, but far more the labia of the female, to which they were similar not only in shape and size, but in the way their inner surfaces lay in exact apposition, except at the upper part, where they were separated by the overlapping penis. Between the labia in the median line, two and a half inches from the anus, was the urethral opening, into which a No. 12 catheter could be readily introduced by directing it downwards and backwards. The posterior border of this orifice was formed by a crescentic fold of mucous membrane, while anteriorly the opening was continuous with the urethral groove of the penis. There were no traces of nymphæ, or of a vestibulum vaginæ. Posteriorly the labia blended with the skin of the perinæum, about an inch from the anus.

Description of the internal genito-urinary organs.—On looking into the pelvis the bladder was seen lying in its normal position, and behind, and adherent to it, was felt a solid body, evidently the uterus, the fundus of which projected slightly above the level of the bladder. The peritoneum was reflected directly from one organ to the other without forming any vesico-uterine pouch, and it extended laterally from the sides of the uterus and bladder to the brim of the pelvis, forming two distinct broad ligaments. From the fact that the uterus was not fairly in the middle line,

but lay considerably to the left side, the left broad ligament was necessarily shorter and smaller than the right.

Dissection of the parts.—On laying open the bladder, it was found to be normal in size and shape. The urethra, which measured one inch in length, joined the vagina about half-an-inch from the common external orifice, and presented no unusual features. The vagina was about two and a half inches long, and devoid of rugæ; its calibre was sufficiently large to admit the little finger, except near the external orifice, where it was very constricted. Tracing it upwards, it was found to be continuous with the cavity of the uterus, which has been described as connected with the posterior wall of the bladder. The uterus was provided with a distinct os externum, the lips of which were clearly recognisable. On slitting up the organ itself, the arbor vitæ of the cervix was found to be well developed, and the cavity of the uterus was large in proportion to its bulk; the walls, on the other hand, being only the eighth of an inch in thickness. Passing to the structures found in the broad ligaments on the left side, there was a fallopian tube, perfectly developed, and of a size proportionate to that of the uterus; it terminated in an open fimbriated extremity, from which a very fine probe could be passed into the cavity of the uterus. On this, the left side, an imperfect round ligament could be traced, but no vestige of a genital gland, whether testis or ovary. Very singularly, however, in the immediate neighbourhood of where the genital gland might have been expected to lie, and within a short distance from the fimbriated extremity of the fallopian tube, there was a somewhat ill-defined body, which looked like a lobule of fat, projecting, so as to be almost pendulous, from the surface of the ligament. When the peritoneum and fat were removed from it, it was found to contain a series of tubules, which in their arrangement corresponded exactly to those which form the parovarium or organ of Rosenmüller in the normal broad ligament; in fact, it might be considered as a tolerably well-marked specimen of a parovarium. Turning to the right broad ligament, there was seen, as upon the left side, a distinct fallopian

tube, only not so large or so well developed as the left one. Its canal was also continuous with the uterine cavity, but its fimbriated extremity was very feebly marked and was not patulous. This fimbriated extremity was adherent to a body which represented the right genital gland. On examining carefully the genital gland, which was about the size of a half grown acorn, it was found to be distinctly of the nature of a testicle. A section of it presented the characteristic lobular appearance of that organ, and portions of it, when placed under the microscope, were found to consist of convoluted tubes $\frac{1}{16}$ th of an inch in diameter. At a short distance from the testicle was a small firm mass, which was found to be the globus major or caput epididymis, the coni vasculosi of which were clearly traceable. From the caput epididymis an exceedingly tortuous duct, which must be considered as the representative of the body and globus minor of the epididymis passed between the layers of the broad ligament towards the body of the uterus, in a direction nearly parallel with that of the fallopian tube. As it approached the uterus, it became less and less tortuous, and finally almost straight. It could be traced with great ease, running down the side of that organ, very closely connected to it, to a point nearly on a level with the os uteri, where it abruptly terminated in a cæcal extremity. The greater part of that portion of the tube which ran down the side of the uterus was very much dilated and presented, when laid open, a number of imperfect septa stretching across it, which gave it an appearance not unlike the duct of the gall bladder. The existence of any distinct connection between the testicle itself and globus major of the epididymis was very difficult to determine, as a careful examination only showed one or two delicate uniting filaments, which might be considered as representing the vasa efferentia, and whether these were permeable or no, it was impossible to ascertain.

Briefly, then, to recapitulate: there were present in this subject a tolerably developed vagina and uterus, in the left broad ligament were found a fallopian tube, a round ligament, and what was considered to be a parovarium, but no trace of either testicle or ovary; while in the right broad ligament there existed

a fallopian tube and a distinct testicle with an epididymis and a vas deferens, which was traceable on the side of the uterus as far as the cervix, the junction, however, between the testicle and the epididymis being very feebly, if at all, developed. The conformation of the pelvic cavity may be regarded as intermediate between the male and female types. The following are the measurements of the diameters of the inlet:—

	Inches.
Antero-posterior	$3\frac{2}{3}$
Transverse	5
Oblique	$5\frac{1}{8}$

There is one point in connection with our case which requires a passing comment, namely, the alleged partial occurrence of the menstrual function, although, as was afterwards ascertained, no ovaria existed. I do not think we ought to doubt altogether the truth of this statement, as the interior of the uterus represented a large surface, the lining membrane of which had a most natural appearance, and, moreover, the person herself could hardly be supposed to have any object in deceiving.

We have now to consider the subject of hermaphroditism, and the best way to obtain a clear comprehension of these malformations is to make ourselves acquainted with the natural development of the genital organism in intra-uterine life; for the investigations of modern embryologists have been of the greatest assistance in enabling us to understand the possibility of their occurrence. I have thought proper, therefore, here to introduce a short summary of the fetal development of the internal generative organs.

In early embryonic life, situated below the kidneys, on either side, are two conical-shaped organs named the Wolffian bodies. These structures act as the primordial kidneys, and as the latter become developed they disappear. Each Wolffian body possesses an excretory duct, which runs down from its summit along its outer side, and opens into the allantois, or rather into that part of it which is known as the uro-genital sinus. Upon the inner side of these bodies there soon appears a genital

gland, which is the future testis or ovary. About the same period of embryonic existence a whitish band, which afterwards becomes hollowed out into a tube under the name of Müller's duct, is developed on the inner surface of each Wolffian body, opening below into the uro-genital sinus close beside the excretory duct. So far as development has yet proceeded, the rudimentary structures necessary to the organism of either sex are present, and according to the type or innate sexual impress of the new being will depend the development of some of the structures and the atrophy of others. Thus, in the male the excretory ducts of the Wolffian bodies are developed into the vasa deferentia, and the genital glands assume the characters of the testis, while Müller's ducts cease to grow. In the female, on the contrary, Müller's ducts are developed into fallopian tubes, uterus, and vagina, and the genital glands assume the character of ovaries, while the excretory ducts cease to grow. The upper ends of the Müllerian ducts form the fallopian tubes, and in animals the cornua or horns of the uterus; while their lower ends become fused together into a single tube, which at a later period is differentiated into the body of the uterus, the cervix, and the vagina. Where the fusion is not complete, a double uterus or vagina is the result. The Wolffian bodies themselves, as the above-mentioned parts become developed, gradually dwindle away, and upon their summits is developed a new formation, dissimilar to the Wolffian body proper, which, in the male, ultimately forms the globus major of the epididymis; and in the female, the series of tubules situated between the layers of the broad ligament close to the ovary, which is known as the parovarium or organ of Rosenmüller.

In the adult female, the remains of the primitive excretory ducts are ordinarily to be found under the name of Gaertner's ducts, on the anterior aspect of the vagina in the lower animals, especially the ruminantia, and they may be considered to represent the vasa deferentia of the male.

In the adult male, the remains of the primitive Müllerian ducts are represented by the sinus-pocularis or utriculus in the

prostate gland, which is the analogue of the uterus and vagina of the female.

The following table will make this brief account more easily understood:—

Table illustrative of the development of the common primary foetal genital system, according to the sexual type.

	IN THE MALE.	IN THE FEMALE.
GENITAL GLANDS .	Testes. . . .	Ovaria.
MULLERIAN DUCTS .	{ Disappear (except as the sinus pocularis) . }	Fallopian tubes, uterus, and vagina.
EXCRETORY DUCTS OF WOLFFIAN BODIES .	{ Vasa deferentia . }	{ Disappear in the human subject, (remains, if in the lower animals, under the name of Gaertner's ducts.) }
NEW FORMATION ON THE SUMMITS OF THE WOLFFIAN BODIES	{ Globus major of epididymis . }	{ Parovarium or organ of Rosenmüller. }

With respect to the development of the external organs of generation, it is quite sufficient for me to state that the scrotum corresponds to the labia majora and the penis to the clitoris.

I would observe, in anticipation of the subject we are about to consider, that as we have seen only one genital gland, whether testis or ovary, appears on each side in connection with its Wolffian body, we ought to be exceedingly cautious in believing that both organs have ever been found on the same side, and indeed we may be sure that, in cases where such an anomaly was supposed to exist, there was a fallacy somewhere. The subject we have before us, which is one of great interest, has been very fully worked out by Sir James Simpson, in the *Cyclopædia of Anatomy and Physiology*, and I have liberally availed myself of his valuable researches.

Hermaphroditism has been divided into two classes, the true and the spurious. The spurious is that in which the imperfection is confined to the external organs. In the male it is commonly due to arrest of development; in the female, to excess of development, but with this class we are not now concerned. The true, which is again subdivided into two varieties, the "lateral" and the "transverse," has to do with the internal organs. In the lateral we find a strange admixture of the sexual types, while the genital organism on each side is antagonistic, male on one, female on the other. In the transverse, the female sexual type is found associated with the distinctive genital glands of the opposite sex. Our case belongs to the "lateral" sub-division, and Professor Simpson, in addition to many in the lower animals, has collected two or three very similar instances in the human subject.

In one, a young person about fourteen years of age, fallopian tubes, uterus and vagina existed, while on the right side there was a testis, on the left an ovary. The vagina and urethra terminated in a common constricted opening in the perinaeum. The external organs were those of a hypospadiac male. Strange to say, during life this case had always been looked upon as belonging to the male sex. Another, and still more remarkable case, is that of Marie Derrier, or Charles Doerge. This person was registered as a female, but at forty was persuaded to change his name and dress to those of a man. After death, however, fallopian tubes, uterus and vagina were discovered, with a testis on one side and an ovary on the other. From the description of the general configuration of the body, and of the disposition of both the external and internal generative parts, I am led to believe this case was exactly parallel to the present one.

Simpson has given us a full account of this malformation in a domestic fowl that he himself had an opportunity of examining, and I adduce it, simply because it assists us to take a correct view of lateral hermaphroditism. The fowl had all the appearance of being a cock, and until it commenced to lay eggs was considered to be so. On the right side, although no testis could be discovered, a well-developed vas deferens was found; on the left was a normal ovary and oviduct. The bird was never

known, however, to incubate; but, on the other hand, crowed regularly, and often attempted to imitate the functions of the cock.

The present example of lateral hermaphroditism may be considered, then, to occupy a neutral position, as possessing in combination some of the characteristic attributes of both sexual types, although probably the feelings, if any existed, were slightly more in common with women than men. I think that the absent genital gland on the left side is an ovary and not a testis: the fact of the uterus lying much over to that side, and the presence of the parovarium in the broad ligament, tends to support this opinion; for there can be no doubt but that in very early foetal life a rudimentary genital gland appeared, but, development failing, it dwindled away.

Recollecting the natural development of the primitive embryonic structures, we can readily comprehend the several anatomical deviations in malformations of the sexual apparatus. We have, however, another element in true hermaphroditism to consider—an unseen, vital element—I mean that of the sexual types, which, as I shall point out, exist independently of the existence of distinctive genital glands, whether testes, or ovaries. Let us, therefore, ascertain the normal relation of the sexual types to the individual. In the first place, it does not seem too hypothetical to infer that both sexual types co-exist in man and in every vertebrate animal, and that the evident sex is merely the prevailing type, the individual being born with the latent element or type of the opposite sex. We cannot suppose that it is a matter of chance or accident in the development of the embryo which type is to predominate, for we know that the genital system of the foetus is at first of such a double character that it is as capable of being developed into the male as into the female organs; it is, therefore, more reasonable to think that naturally one or other sexual type is destined to distinguish the life of the new being from the moment of fertilisation of the ovum, for no one can deny that the sex of the future bird is predetermined in the egg before incubation commences. From the well known fact of the dove tribe ordinarily laying but two

eggs, which almost invariably hatch a cock and hen bird, a "pigeon pair" has become a proverbial expression.

We will now see what evidence we can find in support of our theoretical inference that both sexual types co-exist in man, and in all vertebrate animals. It is found that some of the peculiarities of the latent or opposite type are sometimes evolved, while at the same time many of the attributes of the individual's proper sex to a great extent disappear. We find this to be the case when the influence of the ovaria upon the system is lost, whether as the natural result of age, or from their removal by operation. Thus the effect upon a young woman,* whose ovaria formed hernial tumours at the inguinal rings, and in consequence of their incapacitating her from work were removed, was to cause suppression of the catamenia and atrophy of the mammary glands, while the body assumed a decidedly masculine type. So also in women who have passed the "change of life," that is to say, in whom the functional activity of the ovaria has ceased, we constantly remark a tendency towards the assumption of the attributes of the male type, as there is often an increase of hair upon the face, the voice becomes stronger and deeper toned, while the elegance of the female form is lost, and not unfrequently the mind exhibits a more determined and masculine cast. A like change has been noticed after the cessation of reproductive life in the female deer, in which horns similar to those of the stag are then developed. But it is in birds, after they have ceased to lay, that the alteration of the type is most remarkable, for not only may the female acquire the variety of colour and the brilliancy of the male plumage, but even, as in the case of domestic fowls, the spurs, comb, and wattles of the cock, besides which she may even imitate the function of the male bird.

On the other hand, in the male sex, when the testes have been removed early in life, not only are the special characters of that sex not evolved, but, on the contrary, the peculiarities of the latent female type come out. Thus, in the human species, if

* Pott's Surgical Works, quoted by Simpson.

this loss has been sustained before puberty, the beard does not grow, the voice remains unchanged, and the mammary glands are so modified that they assume a resemblance to those of the opposite sex. Again, the assimilation to the female type is exemplified in the ox, and the approach to the female configuration under similar circumstances in our domestic animals is so well recognised as to require no further comment.

I think that these facts, taken collectively, are sufficient proof of the normal duality of the sexual types in the individual; and we may safely infer that when the natural ascendancy that one type should assume over the other fails to take place, lateral hermaphroditism is the consequence. Although the genital glands by their presence no doubt exercise an extraordinary influence on the sexual character, yet, strange to say, as we stated at page 47, the apparent sexual type is sometimes found at variance with the existing genital glands, so generally regarded as distinctive. Examples of these anomalous malformations belong to the "transverse" subdivision of hermaphroditism. The subjects of the "transverse" variety possess the female configuration and sexual type, while internally the ovaries are replaced by testes. The most common example of this irregularity is that of the free-martin cow, where we have, to all appearance, a heifer—that is to say, the female type—while internally an imperfect vagina and bicornuated uterus are found associated with testes and vasa deferentia.

In the human subject the case of Maria Arsano* is probably a perfect analogue to the free-martin cow. This person died at the age of eighty, after having passed through life as a female, and having been married as such; yet after her death, although "the external organs of generation were those of a female in their natural or normal state," it was found that the vagina was short, and terminated in a *cul-de-sac*, and that the uterus was absent, while testes and vasa deferentia replaced the ovaria and fallopian tubes. Two other instances in the human female have come to my knowledge, in which the female sexual type was obvious, notwith-

* Vide Simpson, in Todd's *Cyclopædia of Anatomy and Physiology*.

standing that true testes supplied the place of ovaries; in both these cases the vagina and uterus were imperfectly developed.*

I would observe that the converse of this anomaly, namely, the male type associated with the female genital glands, most probably has never been met with; for it would assuredly have been discovered in the lower animals if it were liable to occur.

But there yet remains for me to mention, although not included among genuine hermaphrodites, (meaning by such, cases where either both sexual types co-exist, or cases in which the general female type is found in conjunction with male genital glands,) a form of malformation which may happen in the male subject, where, in addition to the proper organism of that sex, a more or less perfectly developed vagina, uterus and fallopian tubes may be found. When we remember that in early intra-uterine life, the Müllerian ducts only attain their full development in the female, while in the male they cease to grow and are lost, except at the sinus pocularis, which represents the lower extremity of the conjoined ducts, and corresponds to the vagina and uterus of the female, we have no difficulty in understanding the possibility of this anomaly occurring. It is probable that such cases have their origin in some faulty innervation of the sexual organism at an early period of foetal life, whereby these ducts, instead of ceasing to grow, have gone on developing. Examples are recorded of the superaddition of a more or less perfect vagina and uterus, in several of the male lower animals. In the human subject we have an instance in the case of a soldier,* twenty-two years of age, who died of his wounds, in whom the male genital organs were complete, except that the testes were undescended, while fallopian tubes, uterus and vagina were also present. The man Valmont,† is most probably another example of this malformation; he was married as a man, but on examination after death it was found that the testes (?) were retained in the abdominal cavity, and that fallopian tubes, uterus and vagina, which latter opened into the membranous portion of the urethra,

* One of the instances had been a prostitute.

† Quoted by Simpson, in the article referred to.

existed. In both these instances of this malformation in the human subject, one circumstance is present, which seems to justify our referring the origin of the anomaly to faulty innervation of the sexual system in the foetal state, namely, that the male genital organs were more or less defective in development, seeing that the testes were undescended.

I trust that these remarks will help to clear away some of the difficulties connected with a subject of so much interest as the development of the genital system. The specimen that has suggested this paper may be seen in the Museum of the School of Medicine, together with photographs of the external generative organs, taken shortly after death.

ANATOMICAL PECULIARITIES OBSERVED DURING THE WINTER SESSION, 1866 - 67.

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It is not intended in this paper, which must necessarily be brief, to describe every deviation from the normal arrangement which may have existed in the subjects received for dissection, but merely to give an outline of the most remarkable of those which came under my notice. With regard to some abnormalities, their frequency has been carefully observed and noted, but, for various reasons, this has not been practicable in the case of all. One of these reasons is that the supply of bodies was considerably in excess of the demand, thirty-one subjects having been sent into the dissecting-room, and it was therefore impossible to get all the parts properly and thoroughly dissected. In future, however, it is hoped that, through the aid afforded by an increased number of students, and the appointment of a second demonstrator, no deviation shall escape notice, or fail to be recorded.

I propose to describe the peculiarities under the several heads of
1. *Muscular.* 2. *Vascular.* 3. *Nervous.*

1. *Muscular.*—These were principally observed in connection with the front of the chest, and the upper extremity, where deviations seem to be of more frequent occurrence than in other parts.

Supra-costal.—The muscle so named by Mr. Wood, which is situated underneath the pectoralis major, and over the ribs, was only found in one subject. It was present on both sides, but was larger on the left than the right side, being respectively about $1\frac{1}{2}$ and 1 inch wide. It passed from the first rib, at the junction

of the bone and cartilage, to the upper border and anterior surface of the fourth rib, giving slips to the intervening ribs in its course.

Musculus sternalis.—This muscle was also only observed in one body. It existed only on the right side, and was associated with a very extensive origin of the pectoralis major. It is usually described as arising below, and having its insertion above, but it certainly appeared to me that its upper attachment was the more fixed. It was attached above, where it was very narrow, to the second costal cartilage and contiguous portion of the sternum, and passed in a curved direction, and becoming considerably wider, to the aponeurosis of the external oblique muscle of the abdomen. Both its extremities were tendinous, but the intervening part was entirely muscular.

Pectoralis Minor.—The origin of this muscle was unusually extensive in one subject, having been attached to the first five ribs on the left side, and from the second to the fifth on the right. None of those unusual insertions of this muscle which have been described were observed, though frequently looked for.

Biceps.—A third head of origin existed in connection with this muscle on three occasions. In each case it was only on one side, twice on the right, and once on the left. The extent of its attachment varied; in two examples it was about an inch wide, and placed just outside the insertion of the coraco-brachialis, with which it seemed partially blended, as well as with the brachialis anticus; in the other subject it was two inches wide, and partly connected with the internal intermuscular septum. In no instance was a fourth head seen. On one occasion this muscle sent a tendinous slip over the brachial artery, to be inserted into the inner condyle of the humerus.

Palmaris longus.—In the subject which had the supra-costal muscles, the palmaris longus was absent on both sides, while the palmaris brevis was very well developed. A kind of second *palmaris longus* was observed on one occasion, placed outside it, arising from the common tendon, and ending below in the fascia at the front of the wrist. It was a good sized muscle, and was found on both sides.

The slip which passes from the coronoid process of the ulnar

to the *flexor longus pollicis* was sometimes absent, while on the other hand it was very large in some cases, and once passed on to the internal condyle of the humerus, to which it had a firm attachment.

The muscular system of the lower extremity was particularly uniform, and free from any marked peculiarity, with the exception that an unusual slip in one case presented itself in connection with the extensor brevis digitorum, arising from the os calcis, and passing forward to have a distinct insertion into the inner side of the base of the first phalanx of the second toe.

I may add that I carefully noticed the number of times the *psaos parvus* was present, and found it in six out of the thirty-one bodies, making an average of about one in five. It was in each instance present on both sides.

2. *Vascular*.—It will be best to notice the peculiarities in this system according as they affect the several regions of the body.

a. *Head and neck*.—The place of division of the common carotid artery was singularly uniform, being in all the subjects about the usual spot, viz., opposite the upper border of the thyroid cartilage, and therefore the relative lengths of this vessel and the external and internal carotids did not present any variation that would be practically important. With regard to branches, the common carotid artery gave origin to the superior thyroid twice, and in another instance a third or middle thyroid artery arose from it. The facial and lingual arteries came off together in one subject, forming a rather large trunk, which, after a short course, divided into the two vessels above named.

The *subclavian artery* varied in some degree, as it usually does, in the height of its arch, but no great extreme was observed in this respect. Its branches presented many and frequent peculiarities, the principal of which were the following—

Separate origin of the inferior thyroid.

Posterior scapular arising separately from the third part of the subclavian (very common).

Two suprascapular branches, a small one from the thyroid axis, and a larger one from the third part of the subclavian, afterwards uniting to form one trunk; the posterior scapular coming off as usual from the transverse cervical.

A single branch, dividing immediately into superficial cervix, posterior scapular, and supra-scapular, the inferior thyroid being separate.

The transverse cervical giving off the ascending cervical.

b. Upper extremity.—The thoracic branches of the *axillary artery* were subject to considerable variation in number and arrangement. This vessel gave origin in one subject to a large trunk, which afterwards divided into anterior and posterior circumflex, subscapular, and superior profunda branches. There were three examples of high division of the *brachial artery*, or, rather, what appeared to be a high origin of the radial. In two of these it was only on the right side, but in the other on both sides. It took place at about the junction of the middle with the upper third of the arm. In each case the radial arose from the inner side of the brachial trunk, and then wound over the continuation of it, to get to its outer side. It took a very superficial course in one instance, being only covered by the skin and fascia above, and, in addition, the bicipital fascia lower down. The basilic and median basilic veins were placed immediately over it, and had the latter been opened, there would have been great danger of wounding the artery. It was also very near the surface in the fore-arm, being close beneath the skin, and not at all overlapped by the muscle. Its relation to the median nerve varied. In two instances the artery lay over the nerve, crossing it once or twice, but in the third example the cords forming the nerve united low down, and surrounded the artery, the trunk afterwards lying over it for some distance. The vessel remaining after the giving off of the radial took the usual course, and gave origin to the ordinary branches of the brachial, being afterwards continued into the fore-arm as the ulnar. There was a bony and tendinous arch in connection with the front of the humerus, towards its lower end, in one subject, through which the brachial artery and median nerve

passed. Only one example was noticed in which the median nerve passed underneath instead of over the brachial artery.

The *radial artery*, in one instance divided about two inches above the wrist into two branches, one being the *superficial volar*, which was the larger, and which passed over the muscles of the thumb, being, therefore, very near the surface, to join the superficial palmar arch, to the formation of which it contributed rather more than the ulnar. Before joining the ulnar, it gave off digital branches to the thumb, fore-finger, and half the middle finger. The other branch took the ordinary course of the radial artery to the back of the wrist, and afterwards entered the palm to form the deep palmar arch, not giving, however, its usual branches to the thumb and fore-finger.

The superficial veins of the fore-arm were arranged in very different ways, but the only variety calling for special notice was the following:—The median vein was absent, but there was a very large radial, which divided into median cephalic and median basilic, the latter being afterwards joined by the deep median and the ulnar, to form the basilic.

c. Trunk.—No very remarkable peculiarity was observed in regard to the arch of the aorta, either as to its direction, height, or the arrangement and number of its branches. The abdominal aorta divided in three subjects opposite the upper border of the fourth lumbar vertebra. The length of the common iliacs in these instances varied; in one, they were very short, being only about an inch long, and dividing above the fifth lumbar vertebra; in another, the left iliac measured $2\frac{1}{2}$ inches, but the right only $1\frac{1}{4}$ inch; while in the third example, the left measured $3\frac{1}{2}$ inches, and the right 3 inches.

The only deviations noticed in the branches of the abdominal aorta, were the separate origin of the hepatic artery, and the presence of two renal branches. The latter existed in one case in connection with a horse-shoe kidney (to be described hereafter), and here there were two vessels on each side, making four altogether. In another subject the second artery was only present on the right side. In each instance the abnormal vessel was of

considerable size, and was the last branch of the aorta, coming off from its anterior part, just above its bifurcation.

The following peculiarities of the branches usually arising from the internal and external iliac were noted:—

The origin of the obturator artery from the epigastric.

The same artery formed by two branches, one from the epigastric and the other from a trunk common to it and the pudic.

All the branches of the internal iliac coming off from its posterior division, except the pudic and sciatic.

In one instance, the gluteal artery arose from the *femoral*, and passed upwards and outwards, first over the *psoas* and *iliacus*, and then underneath the *tensor fasciæ femoris*, which it supplied, to be distributed to the gluteal muscles.

The remains of the hypogastric artery was unobliterated for a considerable distance in one subject.

The epigastric and circumflex iliac arose not uncommonly from the *femoral*, in one case three-quarters of an inch below Poupart's ligament, this peculiarity occurring on both sides. These vessels were always opposite one another, so that whenever one moved towards the femoral the other followed it.

There was one example of the circumflex iliac arising from the external circumflex artery of the thigh, which came from the femoral high up.

d. Lower extremity.—The only peculiarities worth recording in this part were in connection with the femoral artery and its branches.

The distance of the origin of the profunda from Poupart's ligament varied within the usual limits, but in one instance it came off $8\frac{1}{2}$ inches below that line; this was on the right side, the left being only $2\frac{1}{2}$ inches below. This was the greatest extreme noticed in that direction, but it more than once arose close to Poupart's ligament.

The external and internal circumflex originated not unfrequently from the femoral trunk, sometimes one, sometimes both, the external presented this peculiarity most frequently, and in one instance gave off the circumflex iliac, as before mentioned.

There was one example of the external circumflex arising on both sides in common with the profunda, about an inch from Poupart's ligament, and another in which both circumflex came off in this manner, the internal then crossing the pectineus superficially, and dipping down between it and the adductor longus to get to the upper border of the adductor brevis, afterwards taking its usual course.

With regard to the venous system of this part; the only abnormality noticed was the continuation of the popliteal vein along the back of the thigh, instead of passing through the adductor magnus with the artery; towards the upper part of the thigh it perforated the adductor muscles, and then joined the profunda vein to form the femoral.

3. *Nervous*.—The principal deviations occurring in this system were in connection with some of the branches of the brachial plexus. The two parts entering into the formation of the median nerve occasionally united very low down, sometimes even near the elbow, so that there were two nerves accompanying the brachial artery. In one instance, associated with the above peculiarity, and a high division of the brachial artery, the musculo-cutaneous nerve was absent, the median supplying the muscles on the front of the arm, and afterwards giving off a cutaneous nerve for the fore-arm.

In another subject, the musculo-cutaneous came off from the median low down, and passed along, and then underneath, the biceps, not perforating the coraco-brachialis.

The following arrangement came under notice three times:—The outer branch to the median was very small, but after the musculo-cutaneous had perforated the coraco-brachialis, it gave off a large branch, which went to join the median, thus enlarging it to its usual size.

The phrenic nerve arose entirely from the fifth cervical nerve, and therefore from the brachial plexus, in two subjects.

In the lower extremity, what was particularly noticed was the variation in the nervous supply of the toes, on their dorsal aspect. The external saphenous nerve was several times un-

usually large, and supplied the two outer toes, and half the next; along with this, in one body the remaining toes were supplied as follows:—the great toe and half the next by the musculo-cutaneous, and the remainder by the anterior tibial, thus completely altering the usual mode of distribution. The musculo-cutaneous nerve occasionally took the place of the anterior tibial, supplying, in addition to the usual number of toes, the contiguous sides of the great toe and the next.

The external cutaneous nerve of the thigh was absent in one subject, the genito-crural taking its place.

Before concluding this paper, I will add a brief description of a horse-shoe kidney which was met with in one of the subjects.

The union between the two kidneys was, as is usually the case, at the lower end, and was complete, the cortical substance of one side being continuous with that of the other. The uniting part crossed the aorta just over its bifurcation, and the inferior mesenteric artery passed down in front of it, producing a well-marked groove. The combined viscera weighed $8\frac{1}{4}$ oz., the left portion appearing rather the larger, and extending a little higher than the right. The position of the ureters was very unusual; instead of passing down behind, as they commonly do in specimens of this kind, they came forward, and then curved downwards over the upper concave border of the united kidneys, to get to the pelvis. As before mentioned, there were two renal arteries on each side. The spermatic arteries had a long course, especially that of the left side, curving round the kidneys, and appearing to be pushed aside by them.

SIX CASES OF PRIMARY AMPUTATION AT THE SHOULDER-JOINT.

BY HENRY LOWNDES,

SURGEON TO THE LIVERPOOL NORTHERN HOSPITAL.

In the following series are comprised all the primary amputations at the shoulder joint I have had to perform at the Northern Hospital. I shall relate the cases, with short remarks on each, and then add a few general observations on primary amputation.

CASE No. 1.—William Myers, aged 36, a carter, was admitted on June 16th, 1864. He stated he had been bitten, and afterwards got down and kicked, by a horse he had charge of. The right humerus was fractured in its upper third, and there was an extensive lacerated wound on the front of the arm and another at the back; through these wounds the hand could be passed freely down to the fractured surface of the upper end of the humerus, and also up into the axilla, into which the broken end of the lower portion of the bone had been drawn up. The bone was not much comminuted, the elbow and forearm were a good deal crushed. There was a large contusion over the right scapula and the right side of the chest, and fracture of the ribs was suspected. There was a good deal of collapse. At 10.30 p.m. I amputated at the shoulder-joint. There was barely sound skin enough to cover the wound. Three arteries were secured with ligatures, and a vein that bled with an acupressure needle and wire. He had had thirty drops of laudanum on admission, ordered brandy to be given freely in the night, and no more opium. 17th, 11 a.m. he is heavy, and has slept a good deal, breathing much oppressed, mucous râles, pupils rather contracted, emphysema has appeared on the right side and extends upward on the neck, pulse 120, tongue dry and furred, some delirium,

he has passed water. To have half an ounce of brandy every two hours, ice and lemonade; with a mixture containing carbonate of ammonia and sulphuric ether every second hour. A large strengthening plaster was applied over the ribs on the right side. 9 p.m., much the same, but not delirious. 18th. The emphysema has extended to the left side of the chest, breathing still much oppressed, tongue more moist, pulse 120, stump looking well, free discharge of serum, no sloughing; dressed with wet lint. To have a castor oil injection. At 8 p.m., he took rather a large quantity of beef tea at one time; about 5 p.m., he was seized with a violent pain in the right side, pulse 134, respiration 56. Hot fomentations were ordered, and an ounce of brandy every hour. 9 p.m., pain less severe, pulse 120, sharp and hard, face flushed, skin hot, his bowels have been moved; ordered a grain of opium every four hours, and an ounce of brandy every two hours, beef tea in small quantities, turpentine applications to the side, and a poultice to the stump. 20th, noon, he is decidedly better, pulse 108, tongue very much furred, respiration 40, skin cooler and moist, he has slept a little, stump rather sloughy, and lower flap much inflamed. 9 p.m., seems still improving, has taken a little bread and milk. 21st, noon, pulse 108, rather weak, tongue dry and brown, breathing still oppressed, and mucous râles present, friction sound distinctly audible on the right side, face congested, neck still rather emphysematous, slight delirium, passes water freely. To omit the opium, and take again the ammonia and ether; a small blister to be applied to the right side; to take half a grain of morphia at night.

22nd.—Pulse 120, respiration 44, breathing easier, and respiratory murmur more natural; he is delirious, skin hot, tongue dry and brown, he has not slept well, ordered one ounce of brandy every hour.

23rd.—11 a.m., pulse 132, respiration 32, tongue brown and dry, has slept badly, stump discharging freely, appetite better. In the evening he seemed still a little better, but about 8 a.m., on the 24th, eight days after the operation, the stump began to bleed, and before this was found out a very large quantity of blood was lost, and he died about a quarter of an hour after the house

surgeon had been summoned to him. No post-mortem examination was permitted, but it was ascertained that there was fracture of one or more of the ribs on the right side.

I have recorded this case pretty fully, because the attack of emphysema and acute pleurisy connected with the fractured rib had, I think, much to do with the fatal termination. The oppression of the breathing, and the bronchial effusion from the first, seemed to make the free use of stimulants necessary, and their administration tended in my opinion to produce the sloughy state of the stump, and so led to the secondary hæmorrhage. The case was very disappointing, as the man seemed almost to have got safely through the severe pleuritic complication.

In the treatment of secondary hæmorrhage occurring some days after operation, we have now adopted at the Northern Hospital the free application of the actual cautery, and I have seen it used in several cases with the very best effects. It not only effectually arrests hæmorrhage, but where there is a sloughy wound it produces a complete change of action, and its use is often followed by the appearance of a healthy granulating surface. Care must be taken, when large linseed meal poultices are applied in order to promote suppuration in a stump (and I shall refer by and by to their value), that they be not applied too hot, lest they provoke bleeding. Care must also be taken, of course, in changing poultices, that a ligature be not accidentally put on the stretch. The ends of the ligatures should, if possible, be kept looped up by a strip of plaster to the side of the stump, and when they are being thus arranged after an operation, they should be laid on the skin in a loose wavy manner, not stretched straight, lest the swelling of the stump that almost always occurs should cause them to make traction on the vessels.

CASE No. 2—Francis Ryley, aged 4, was admitted on June 22nd, 1864, with his right arm crushed by the wheel of a lorry. It was completely shattered almost up to the joint, and denuded of skin. A circular flap of skin, just enough to form a covering after amputation, was left, and looked pretty sound, but was a good deal detached from the muscles beneath it, which were much injured. The face and forehead were contused and swollen, and

there was a severe contused wound of the right thigh. At 8 p.m., I removed the limb at the shoulder joint, making a covering entirely of skin. The axillary artery was secured by a long acupressure needle passed through the integuments, and a little tape passed over its ends. Three little vessels were secured with small needles on the face of the wound, with looped wire passed over their points and twisted round their hafts. The flaps were brought together with sutures, and no dressing was used. As the boy was a good deal collapsed, a tea-spoonful of brandy every two hours was given.

23rd.—10 a.m., he is going on well, has slept a little, lungs rather loaded. At 5 p.m. on the 23rd he was seized with general convulsions, which continued with intermissions until 7 p.m., when I saw him, and found him still labouring under them. As the stump looked rather tense, I removed the sutures, and also the small needles, twenty-three hours after insertion, and took off the tape from the large one. While I was in the act of doing this, the convulsions seemed to be aggravated. Five minims of laudanum were given, and in an hour's time, as the convulsions were still going on, three minims more.

24th.—He has dozed a good deal in the night, the convulsions have ceased, he is unconscious, and has not spoken. He was ordered four drops of laudanum, and to have milk and lemonade, and no brandy.

25th.—10 a.m., he has had a restless night, pulse 160, small and weak, he is quite conscious, outer angle of wound sloughy, the contused portion of the thigh is beginning to slough, and a portion of exposed fascia, that seemed very tense, was freely divided. Opium draught repeated. To have a tea-spoonful of wine every half-hour. 12.15 p.m., tongue white, he seems improving. I removed the large needle sixty-four hours after its insertion.

26th.—Pulse 148, stronger; breathing a good deal oppressed, stump discharging freely. From this time he improved daily, the wound granulated and slowly healed over, and he made a good recovery, and was discharged cured on Sept. 21st, 1864.

The occurrence of convulsions and the use of acupressure in this case are the points of interest. The convulsions began about

twenty hours after the operation, at a time, then, when reaction would be beginning to set in; and they may have simply marked the accession of re-actionary fever, as we see convulsions ushering in measles or scarlatina in children, and marking the time when the system re-acts, after the shock, as it were, caused by the morbid poison. Or, as the face and head were bruised and swollen, there may have been active congestion of the brain coming on as reaction set in, and causing convulsions. Lastly, the convulsions may have been solely due to the reflex irritation from the stump, which was becoming a little tense, and also perhaps from the points of the small needles. I think probably all these causes had something to do with the attack of convulsions. The fits were certainly much aggravated while I was handling the stump and removing the small needles, not always a very easy matter. Acting on the belief that reflex irritation had much to do with the convulsions, I gave laudanum in doses I consider large for so young a child; nor was I deterred from persevering by the child's becoming unconscious, so long as I found the convulsions kept away.

About the date of this operation, I used acupressure in several cases. An amputation of the thigh for traumatic disease made a good recovery; a long needle was used to compress the femoral artery, and was removed in seventy-two hours. In an amputation at the knee-joint for malignant disease of the tibia, the popliteal artery was secured with a long needle, and a tape over its ends; bleeding came on before the patient left the table, and I substituted a small needle and wire for the long one; bleeding came on again after she was taken to her bed, and I had to open up the wound and use a ligature. This was the only case of hæmorrhage I had, and it would not have discouraged me so much if I had not already found this method troublesome in other ways. In all the cases the small vessels were secured by a small needle, threaded with wire passed under them, and then a looped wire passed over its point and twisted round its haft. I had always some trouble, and in one or two cases very great difficulty, in withdrawing the small needles. In no case did immediate union take place.

Improvements have been made in acupressure since I tried

it; and Professor Pirrie, who is very enthusiastic about it, gives the preference to a mode of securing small vessels in which a long needle is used, whose point is passed through the tissues close to the mouth of the vessel; the handle of the needle is then to be rotated on the face of the stump to the extent of a quarter of a circle, and the point is to be pushed forward so as to be fixed in the tissue beyond the vessel; so that the vessel seems to be twisted and compressed at the same time.

I must confess that I did not find acupressure nearly so easy in execution as deligation. To a person whose sight is pretty good, nothing can be much easier than to seize a vessel's mouth and tie it. Whereas to pass a needle under the course of a little vessel is not easy, when you only see the mouth and cannot be sure what that course is. The neat drawings Professor Pirrie has made, showing round isolated orifices on a smooth surface, give very little idea of the quivering, twitching wound after an amputation. Acupressure has this great advantage, that it permits all foreign bodies to be removed from the stump in a much shorter time than is the case after deligation. On the other hand, it seems to me tedious and troublesome to perform; it does not compress the vessel alone, but often nerves, and a mass of tissue also; it leaves for a short time a number of needle points, that must irritate the sensitive and often twitching surfaces. When the needles with looped wire are used, they are often very difficult to withdraw; and in one case of amputation of the leg that terminated fatally, in an extremely irritable patient, I was not able to get the needles away at all, without more violence than I was willing to use.

I was very sanguine about acupressure when I began to use it, and I should now be glad to watch its use in the hands of others, and to adopt it again if I saw them successful; otherwise I shall be content in general with the use of the ligature. My then colleagues, who patiently assisted me in making trial of acupressure, have none of them adopted this method.* Professor Pirrie describes at length seven different modes of using acu-

* Since the above was written, Mr. Hakes informs me that he is giving acupressure a trial at the Royal Infirmary.

pressure, and as the procedure is still in its infancy we may hope for many more.

CASE No. 3.—William Dooley, aged 10, was admitted on September 12th, 1865, with his right arm extensively crushed by a railway waggon going over it. I removed the limb at the shoulder-joint at 10 p.m.; I was able to make a large flap from the deltoid. Ligatures were used to the vessels. The case went on well without any noteworthy occurrence, and the boy was discharged cured on October 27th, 1865.



CASE No. 4.

CASE No. 4.—George Lloyd, aged 13, was admitted on March 11th, 1867, with his right arm torn off by machinery within three or four inches of the shoulder-joint; the skin was stripped off still higher. The boy was much collapsed. Chloroform was given, and I disarticulated the head of the humerus, and then sawed off a considerable portion of the acromion process. I removed all the muscular tissue I could, but still found I could not nearly draw the skin together to cover the glenoid cavity. I therefore made a long incision from the circular wound down the back of the scapula, and another in the front of the chest,

and detached the skin freely on either side of the incisions from the parts beneath. By this means I was able to make a covering. Ligatures were used. Before the operation was over the boy nearly sank; a little brandy was given him after he had been taken back to his bed, and he slowly rallied.

March 12th.—He has slept well, and has not much pain; pulse, 128; tongue moist; to omit brandy; to have tea, lemonade, and milk. 9 p.m. Is rather restless and rambling; pulse, 124. To have a quarter of a grain of morphia.

13th.—Tongue foul; pulse, 120; bowels confined; the stump looking well. To have two grains of calomel with five of rhubarb immediately.

14th.—After a castor-oil injection, his bowels were moved four times. He feels better, and has slept well. He was ordered ice and four ounces of wine daily. In the evening a troublesome cough came on.

From this time he improved in health, but the wound got into a sloughy state, and ultimately nearly the whole of the skin flaps sloughed, and a very large granulating surface was left. The ligatures all came away by the 25th.

I had gained nothing, perhaps rather lost, by dissecting up flaps of skin, as the surrounding skin was less moveable and elastic than it otherwise might have been. I thought at one time I might have to perform some plastic operation, to cover the large surface, as the skin around seemed so tense, and the new borders of skin had to climb, as it were, over the edges of the prominence of the shoulder, with the further disadvantage of the granulations being quite adherent to the glenoid cavity and the portion that was left of the acromion process. However, after a long and tedious convalescence, the boy is now nearly well; only one little patch on the top of the shoulder remains unhealed, and this is gradually contracting, while the skin round about is now lax enough. Once or twice the wound has been as nearly healed as possible, and with some slight derangement of health the ulcerative process has set in, and undone the work of weeks. He was made an out-patient on September 21st, 1867.



CASE No. 5.

CASE No. 5.—Alfred Matthews, aged 24, engine-driver, was admitted on April 6th, 1867, with his right arm crushed by a railway waggon. Amputation at the shoulder-joint was performed the same day. There was plenty of sound integument on the outside, and a large flap was formed from the deltoid. Ligatures were used. There was not much collapse. No stimulants were given, but tea, milk, and a little beef tea ordered. He was a strong, healthy man.

7th.—He has had a good night; pulse, 116; tongue pretty clean, and moist. The stump is looking well. Two sutures were removed to allow of a little sanious discharge.

8th.—He is doing well, but has rather a troublesome cough. The patient now went on extremely well. He was allowed meat dinner and half a pint of porter on the 12th. A great part of the wound united by the first intention, and it was entirely healed on June 17th, when he was discharged.

In this case there was very little constitutional disturbance. The roundness and fulness of the shoulder were well preserved, although the deltoid had wasted a good deal. The difference in appearance between his full shoulder and what may be called the complete want of shoulder (shown in the photographs of the cases in which the acromion was removed), was very striking. The three patients happened all to be in the hospital at the same time.*

* The photographs were all taken about the middle of September.



CASE No. 6.



CASE No. 6.

CASE No. 6.—Peter Hellewell, a foreman miller, aged 36, was admitted on April 24th, 1867, with his left arm nearly torn off near the shoulder-joint, by the strap of an engine in a flour mill. There was no bleeding, and he was so extremely collapsed that our house-surgeon did not expect him to live from hour to hour, and did not think there was any use in sending out the usual consultation notes. The man was perfectly unconscious, cold, and nearly pulseless. Warmth was applied and stimulants were given, and he slowly revived, but on the 25th was still quite unconscious. On the 25th, at 1 p.m., I found him still perfectly unconscious, but he had a tangible pulse. The humerus was broken at the upper part of the middle third; the skin was destroyed on the outer part of the arm almost up to the acromion, and the bruised and lacerated muscles exposed. There was a strip of sound skin down the inner side of the arm about six inches in length. Although the man's condition was unpromising, my colleagues agreed with me as to the necessity for removing the limb. A little chloroform was given (and very little was required, he had so little sensibility), and I removed the arm at the joint, taking away the fleshy mass of the deltoid,

and removing the greater part of the acromion process. I saved all the skin I could from the inner side of the arm, and was just able to get a covering for the joint. Ligatures were used to the arteries, and the axillary vein, which bled a little, was also tied. He was removed to his ward in a very precarious state, and brandy was administered. 9 p.m. Pulse 130; he is still quite unconscious; his urine has to be drawn off. Ordered beef juice and eight ounces of brandy.

26th.—To-day he is a little more conscious; takes his brandy and beef juice well; he begins to cough a good deal.

27th.—He is improving as far as consciousness is concerned, but is hot and feverish; tongue white; he talks a good deal; he can pass his urine. The flap of skin is all sloughing, but there is not much inflammatory action around the part. A poultice was applied. Ordered ice, lemonade, &c., and to stop the brandy. To take three grains of calomel with eight of rhubarb.

28th.—He is quite conscious, but in rather an excited state, though not delirious. He told me he had just discovered he had lost his arm. He had found it out in an unusual way, for he had reached down his card from the head of the bed, and had read "amputation at the shoulder." The poor man seemed more pleased at his own acuteness in making the discovery than distressed at losing a limb. The wound is beginning to suppurate freely. His tongue is rather cleaner; pulse about 120. In a day or two this mental excitement passed off. His cough now became most troublesome, and he had to have opiates given freely to relieve it. He states that he often suffers a great deal from bronchitis. His state was very precarious for a long time. I was obliged soon to revert to the brandy, and to give it whilst profuse suppuration was going on in very large quantities, as much as sixteen to twenty ounces in the day. The granulations that formed were pale and flabby, and the wound, which was of considerable size, showed little disposition to heal. After a few weeks I had him removed upstairs, out of the general ward into a large airy room, which he had to himself. This room, which is only occasionally used for patients, has a large skylight, as well as windows looking over the river, and is bright and

cheerful. The effects of the change were very marked. He began to have colour in his cheeks; the granulations became red, and the wound began to heal. He was discharged with the wound nearly healed on July 22nd, 1867.

I saw him a week ago. He is very well, and gaining flesh. The wound is healed except in one puckered corner, where there is a little spot not yet cicatrised. The parts about the cicatrix are tender, and he says he cannot bear the shaking of the flour mill yet. The cicatrix is very small, as the surrounding skin was lax, and permitted itself readily to be drawn together.

In this case the main feature was the profound shock. I have no doubt there was considerable effusion of blood, perhaps in the form of ecchymosis, within the cranium, and there was, as might be expected, a good deal of cerebral excitement when reaction set in. Mr. Prescott Hewitt's remarks, in Holmes's Surgery, on the frequent, if not universal, extravasation of blood in the head in cases of shock, are very interesting. We no longer need always puzzle ourselves to decide whether a case is one of concussion or compression, for the two phenomena are, as in this case, often interwoven.

Amputation at the shoulder-joint has been, as far as my individual experience goes, more successful than any of the other great amputations. Only one of the six cases proved fatal, whereas three primary amputations of the thigh I have had have all ended fatally. In fifteen primary amputations of the leg immediately below the knee, I have lost five cases, a mortality of about 33 per cent.

The occurrence of troublesome cough in all the cases of amputation at the shoulder is probably due to some reflex irritation.

I generally apply no bandage after an operation; the edges of the wound are brought together with sutures, and then a little cotton wadding is laid loosely on the face of the stump. After primary amputations in general the striking feature that presents itself is the high inflammatory reaction that follows the double shock the system has received. We have almost invariably, about the second or third day, a hot skin, a rapid pulse,

great thirst, a white dry tongue, generally delirium, and a swollen state of the stump.

In Surgery, most undoubtedly, and I believe it to be the same in the more hidden paths of Medicine, high inflammatory action must be met at first by lowering remedies. If we give alcoholic stimuli when the phenomena I have described are present, in all probability the inflammatory action in the stump will extend up the limb, and traumatic gangrene or extensive sloughing result; probably great delirium will set in, and end in death by coma. The opposite treatment must be pursued, unless the patient be habitually very intemperate. He must be put on strictly low diet, sometimes limited to tea and a little bread for a day or two, excluding even beef-tea. I generally give a dose of calomel with either rhubarb or jalap.

All tension must be removed from the stump, and if there is much redness, or any tendency to sloughing, a soft large linseed meal poultice should be applied early, and free incisions must be made if necessary. Under this treatment the high fever generally soon subsides. The good effects of large poultices in bringing on healthy suppuration are very marked. I have several times seen the character of the tongue change, and lose all its dangerous significance, within a few hours of the first use of this soothing appliance.

Opiates in this stage must be given with great caution.

When once free suppuration is established, the time soon comes when we must give stimulants with a most liberal hand; the stomach is often too weak to bear much solid food, or even much beef tea, and we shall find it necessary to give large quantities of wine and brandy and ale or porter, perhaps for weeks. If this is not done, the patient will sink into a very low state, and will in all probability become the subject of pyæmia.

I must not conclude this report without acknowledging the very great care and attention devoted to the latter cases in this series by our house-surgeon, Mr. Bradley.

TABLE OF OPERATIONS PERFORMED AT THE LIVER-
POOL ROYAL INFIRMARY, FROM AUGUST, 1866,
TO AUGUST, 1867,

WITH REMARKS BY
CHAUNCY PUZEY, *House-Surgeon.*

THIS paper has been written for the purpose of giving a general report of the surgical operative practice at the Liverpool Royal Infirmary, during the last twelve months.

In it I have endeavoured to show briefly for what injuries or diseases the principal operations have been performed, and what has been the cause of death in those cases which have terminated fatally. In a report of this kind, a history of cases could not be given, but I have made a few remarks on some of the most interesting, which I thought ought not to be altogether passed over; and as regards the deaths, I have simply given such an outline of the most prominent symptoms and post-mortem appearances as may be sufficient to show the cause of death. (In some instances even this is unnecessary.) In several cases, from different causes, no post-mortem examination could be made; and in others, only certain parts could be inspected.

I am fully aware that several important cases have been passed over with only a few remarks, though it must appear that they are deserving of much more careful observation; but as it is only a short time since it was proposed to me that this report should be written and published, I have found myself much more unprepared than I should otherwise have been.

It will have been observed that the operations at the Infirmary are performed more frequently for disease than for accident. All the casualty patients from the docks are taken to the Northern or Southern Hospitals. The most serious accidents admitted

come from the railways, many from the rope-works, and other manufactories in the eastern district of the town; but the number of primary amputations is comparatively small. In primary amputations, the nature of the injury must influence the surgeon in choosing the mode of performing the operation; but it is generally different in regard to operations for disease. For amputation of the thigh, Teale's method has been found the most satisfactory, or rather a modification of his operation, by cutting a very short posterior flap and a long anterior one. In amputation of the leg, the best stumps have been made by cutting lateral skin flaps, and completing the operation as in the circular method.

As regards the cases of excisions of joints and important bones, the result cannot, in many instances, be decidedly stated. It is generally, of course, for time to show how an operation of this nature has succeeded; and this is one reason why the operations have been arranged under the heads of 'recoveries' and 'deaths,' instead of under those of 'cured,' 'relieved,' and 'died.' The same observation will apply still more forcibly to the table of operations for cancerous diseases.

With these few remarks, I shall proceed to give a table of all the operations performed at the Infirmary from the end of August, 1866, to the end of August, 1867.

TABLE OF OPERATIONS.

Operation.	Recoveries.	Deaths.	Total.
<i>Amputation—</i>			
of Thigh . . { Primary	8	1	4
{ Secondary, and for disease	7	2	9
at Knee-joint { Primary	0	0	0
{ Secondary, and for disease	1	1	2
of Leg . . . { Primary	2	1	3
{ Secondary, and for disease	7	0	7
of Foot . . . { Primary	0	0	0
{ Secondary, and for disease	8	0	8
of Toes	11	0	11
at Shoulder-joint { Primary	1	1	2
{ Secondary, and for disease	0	1	1
Carried forward	40	7	47

Brought forward	40	7	47
<i>Amputation—</i>			
of Arm	{ Primary 0	0	0
	{ Secondary, and for disease . 1	1	2
of Fore-arm	{ Primary 2	0	2
	{ Secondary, and for disease . 6	0	6
of Hand through metacarpus	{ Primary 2	0	2
of Thumb or Fingers		0	37
<i>Excision—</i>			
of Shoulder-joint	1	0	1
of Elbow-joint	8	0	8
of Knee-joint	1	0	1
of Ankle-joint	2	0	2
of Os Calcis	2	0	2
of Shaft of Tibia	0	1	1
Herniotomy	2	3	5
Lithotomy	4	1	5
Tracheotomy	8	1	4
Trephining	0	2	2
Ligation of Arteries for	{ Aneurism 4	1	5
	{ Wound 4	0	4
Excision of Cancer of	{ Breast 12	0	12
	{ Lip 12	0	12
	{ Tongue 1	0	1
	{ Other parts 6	1	7
Excision of other Tumours	20	0	20
Ovariectomy	2	0	2
For Vesico-Vaginal Fistula	1	1	2
For ruptured Perineum	1	0	1
Ligation of Uterine Polypus	2	0	2
For ununited Fracture	1	0	1
For foreign body in Bladder	0	1	1
For Fistula in Ano	27	0	27
Carried forward	204	20	224

Brought forward . . .	204	20	224
For Harelip	5	0	5
For Hydrocele	13	0	13
Removal of diseased bone	13	0	13
Paracentesis Abdominis	8	0	8
Tenotomy	8	0	8
Forcible dilatation of Urethra	9	1	10
Various	47	2	49
Total	<u>307</u>	<u>23</u>	<u>330</u>

The diseases and injuries for which *Amputation* was performed were as follows :—

Primary amputation of the Thigh.—Four cases, all for railway crushes—one death.

Secondary amputation of the Thigh.

- 2 for disorganisation of knee-joint, after compound fracture of leg.
- 1 for suppuration of knee-joint, from traumatic synovitis.
- 3 for strumous disease of knee joint.
- 1 for extensive necrosis of femur.
- 1 for malignant disease of the lower end of femur.
- 1 for extensive destruction of the leg by a burn.

Total 9 cases, of which two died.

Amputation through Knee-joint.

- 1 for caries of tibia and disease of knee-joint. (In this case the condyles of femur were sawn through.)
- 1 for compound fracture into ankle-joint, followed by spreading traumatic gangrene.

Total 2 cases, of which one died.

Primary amputation of Leg.

- 1 for railway crush of foot, and laceration of leg.
- 2 for compound fracture of leg, with severe laceration.

Total 3 cases ; one death.

Secondary amputation of Leg.

- 1 for disease of knee-joint (ankylosis of patella with femur).
- 1 for caries of tibia.
- 1 for caries of tibia, and disease of ankle-joint.
- 1 for compound fracture of leg a week before.
- 1 for strumous disease of tarsus and ankle-joint.
- 2 for sloughing of flap after Syme's amputation.

Total 7 cases ; no deaths.

Amputation of the Foot.

- 5 for disease of the ankle-joint.
- 2 for carious disease of the tarsus.
- 1 for malignant disease of the tarsus.

Total 8 cases ; all recovered.

Of these, six were cases of amputation at the ankle-joint by Syme's method ; one at the ankle-joint, with a long inner flap as recommended by the late Dr. Mackenzie, of Edinburgh ; and one of Chopart's amputations.

In two of the cases of Syme's amputation, the heel flap sloughed. Both these patients were old women, who were much emaciated, and had very feeble circulation. In these two cases, amputation of the leg was subsequently performed, and the patients did well. One of the other patients, on whom this operation was performed for malignant disease, could rest the whole weight of his body on the stump, in less than four weeks.

Primary amputation of the Shoulder-joint.

Two cases, both for severe compound comminuted fracture of the upper part of the arm. (In each of these cases, there were fractured ribs, with emphysema, and in one of them, dislocation of the spino. This latter patient died.)

Amputation at Shoulder-joint for disease.

One case, for malignant disease of the arm. This case terminated fatally.

Amputation of the Arm for disease.

1 for traumatic gangrene of the arm.

1 for malignant disease of the fore-arm.

Total 2 cases; of which one died.

Primary amputation of the Fore-arm.

1 for machinery crush of hand and wrist.

1 for compound fracture of fore-arm, with severe laceration.

Total 2 cases; both recovered.

Secondary amputation of Fore-arm.

2 for compound fracture and laceration, with subsequent sloughing.

1 for disorganisation of wrist-joint, after punctured wound.

3 for strumous disease of wrist joint.

Total 6 cases; no deaths.

The following *Excisions* were performed:—

Of the Shoulder-joint.—One case. In this instance, the head of the bone, with a large portion of the upper part of the shaft of the humerus, was found almost detached, and was easily removed. The patient was 15 years of age. Result very satisfactory.

Of the Elbow-joint.—Eight cases. Four were for strumous disease, one for destruction of the joint after compound fracture of the olecranon process, one for ankylosis of the arm in the straight position, after comminuted fracture of the condyles of the humerus, three months before admission; and two were re-excisions, one after excision for disease, the other after excision for ankylosis of arm. Of these, five were cured, one went out relieved, and the others are in a fair way of soon having useful limbs. The ages of these patients ranged from 7 to 40 years. In two of these cases, the operation was performed by means of a single straight incision; in the others by the usual H incision.

Of the Knee-joint.—One case; a lad 17 years of age. Operation performed by an H incision. There was extensive disease

of tibia and femur, necessitating the removal of a large slice of bone from each. The patella was gouged, and left. The leg was put up at once on a straight back splint with foot piece, and kept steady by side splints. The patient is still in; but the case has progressed favourably, without any unpleasant symptoms ever since the operation, which was performed eleven weeks ago.

Of the Ankle-joint.—Two cases; of which one was for compound dislocation of the ankle-joint, in which case the astragalus, and articular surfaces of the tibia and fibula were removed after enlarging the wound, (which was on the inner side of the ankle,) upwards. The man left the Infirmary thirteen weeks after, with a good foot and leg, rapidly becoming strong. The other case was that of a lad, 15 years of age, suffering from extensive caries of the astragalus, and lower end of tibia and fibula. The whole of the astragalus, and a large slice of the tibia and fibula, was removed by means of one long incision on the outer side of the ankle, extending from about $2\frac{1}{2}$ inches above the external malleolus to the articulation between the astragalus and os calcis; from which incision another was made as far as the outer side of the tendo Achillis. After the operation there was considerable bleeding from the deep parts of the wound; the posterior tibial artery was therefore cut down upon, and tied behind the inner malleolus, and the hæmorrhage ceased. An anterior tin splint was then fitted to the foot and leg, and the limb swung.

The operation was performed twelve weeks ago, and the lad can move his toes freely, and swing his leg without pain. The foot is firmly fixed to the leg, and, with the exception of considerable thickening about the parts, (which, however, is decreasing,) the case seems likely to turn out favourably.

Of the Os Calcis.—Two cases; both for caries. One was that of a girl, 16 years of age. The bone was removed with considerable difficulty by means of one incision, extending from the calcaneo-cuboid articulation, across the back of the heel, to just behind the posterior tibial artery. The other was a lad, about the same age. In this case the same incision was made, together with one at right angles to the first, at the back of the heel, extending upwards to a little above the level of the astragalo-calcanean

articulation. By these incisions the bone was removed with much greater ease than in the first instance. In both cases the foot and leg were kept supported by a tin splint, applied to their anterior surface.

The girl went out twelve weeks after the operation, and when last seen (about four months ago) could walk almost as well as if she had a perfect foot. The other patient is still in, but now, eight weeks after the operation, is almost well.

Of the Shaft of the Tibia.—There was one case in which this operation was performed. It ended fatally. (*Vide* 'Deaths after Operations.')

Twelve cases of *Malignant Disease of the Breast* have been operated upon during the last year. Of these ten cases were of the scirrhus, and one of the encephaloid form. The nature of the other case has not been noted. In one case of scirrhus the disease returned about six months after operation. The whole of the cicatrix was affected by cancerous disease, and no further operation could be performed. The patient who was suffering from encephaloid disease, was, at the time of operation, about seven months advanced in pregnancy, and considerable care was required in removing every portion of the gland in consequence of the peculiar friability of the healthy parts, owing to her condition. She made a good recovery, without any unpleasant symptoms.

In many of these cases of excision of the breast, and also in some other operations, the plan of washing out the wound with a solution of chloride of zinc has been tried, as recommended by Mr. Campbell de Morgan. It has been found to cause considerable pain, and has been followed in several cases by erysipelas, but in most of the cases the discharge from the wound has been unusually free from offensive odour, and with one or two exceptions, which perhaps were hardly fair cases for trial, the patients so treated have done exceedingly well.

The cases of *Cancerous Disease of the Lip* do not call for any remark, but that of *Epithelioma of the Tongue* is worthy of notice. It occurred in a labourer, aged 47, and involved the lateral portion of the tongue near its base. On the 5th of February, Mr. Bickersteth divided the lower lip to below the chin, and sawed

through the lower jaw in the median line. The two portions of jaw having been dragged apart by retractors, he divided the tongue into two lateral halves, and having severed that half in which the disease existed from its attachments to the floor of the mouth, divided the base close to the hyoid bone, by the wire-rope *ecraseur*. There was very little bleeding. The lower incisors were wired together, and the lip stitched up. Sixty-six hours after operation free bleeding came on from base of tongue. Cold failed to arrest it, and styptics could not well be applied. Mr. Bickersteth was sent for, and in the mean time the bleeding, which was very profuse, was stopped by plugging; small pieces of sponge, to which strings were attached, being pushed down to the bleeding part one after the other, till the side of the mouth whence the disease had been removed was filled, as far forward as the teeth; a long flat sponge was laid over these, so that, when the jaws were closed and bandaged together, the mouth was completely filled. Seventy-two hours after the first operation, Mr. Bickersteth cut down on the lingual artery of the right side, and tied it. The sponges were removed, and the bleeding was found to have ceased. Three days after, there was bleeding from the lingual artery wound, which was stopped by injecting perchloride of iron. A week after the ligation of the lingual artery, copious hæmorrhage again came on from the mouth, the patient became blanched, and almost pulseless; this was again stopped by plugging. A consultation having been held, it was resolved to try the effect of the plugging. The sponges were kept in for forty-eight hours, the patient being supported by stimulant and nutrient enemata. At the end of that time they were removed; there was no further bleeding, and the man made a good recovery, and left the hospital five weeks after. When last seen, about six months after the operation, the remains of the tongue occupied the median line of the mouth, the jaw was firmly united, the man was in good health, and could speak well, but there was some suspicious thickening about the right sub-maxillary region.

Tracheotomy was performed in four cases, three of which were attended by a successful result.

In one case, the operation was performed for syphilitic laryn-

gitis; in another, for croup; in another, for some injury of the larynx and hyoid bone (?); and the other was an operation which can hardly be called tracheotomy, as it was of a much more formidable character, but it is most conveniently placed under that head in this table. It will be found fully described in a paper in these Reports, written by Mr. Long. In the case of laryngitis, there was nothing worthy of particular note. The case where the operation was performed for croup will be noticed among the deaths after operations. The nature of the injury for which tracheotomy was performed in the other case could not be clearly made out. A lad, fifteen years of age, running along in a foundry, fell, striking his neck against an iron girder. He was brought to the Infirmary livid, insensible, cold, and pulseless, with feeble gasping attempts at respiration, and considerable swelling over the hyoid bone and larynx. His trachea was at once opened, the breathing improved at once, and in a few hours he was quite comfortable. The tube was removed about the sixth day, and the patient went out well on the eighteenth day.

The mortality after operation for *strangulated hernia* has been unusually great, three cases out of five having terminated fatally. The successful cases were both operated on early after strangulation, and in one of them (a femoral hernia, occurring in a middle-aged woman) a large portion of omentum, which was firmly adherent to the sac, had to be cut away. Some mention of the fatal cases is made further on in this paper.

Lithotomy was performed in five cases, four of which recovered. Of the successful cases, three were performed by the lateral method, and one by Allarton's. Three occurred in young children, and one in a young man of nineteen years of age.

Trephining was performed in two instances, both terminating fatally. (*Vide* "Deaths after Operation.")

The following *arteries have been ligatured*, for disease or wound, during the last year:—The Carotid, the Femoral (two cases), the Brachial, the Lingual, the Radial (two cases), the Ulnar, and the Posterior Tibial. The carotid was tied for aneurism, and in this case the patient died. The other cases have terminated successfully. The femoral was tied in one case for popliteal

aneurism. (Flexion of the knee and compression of the femoral had been tried without success.) The other case was one of traumatic aneurism of the femoral artery, caused by a punctured wound by a penknife, received a fortnight before admission. It would be out of place here to go into the history of the case during that period. The symptoms were well marked, but in consequence of the patient's assertion that the swelling had not increased for two or three days, and also of the fact of the pulsation rather diminishing during the first day or two of the man's residence in the Infirmary, it was decided to try the effects of rest for a short time. The patient was kept quiet in bed; the foot, leg, and thigh firmly bandaged, and opium given. Under this treatment the pulsation certainly became less for a time; in fact, after ten or eleven days, it was hardly to be detected. However, about the thirteenth or fourteenth day, the man complained of excessive pain down the ham and back of the leg, and on removing the bandage it was found that pulsation had returned, and that the swelling had increased laterally, and also upwards and downwards, in the course of the artery. Chloroform having been administered, and the femoral compressed, the tumour was slit up, and the clots turned out. The femoral vessels could then be easily compressed by a finger inserted in the wound. A puncture could be seen through which arterial blood flowed, when pressure was relaxed either above or below it, and a ligature was passed, and tied above and below this. In consequence of the disorganized and distorted appearance of the parts, there was considerable difficulty in the passage of the aneurism needle. When the structures between the two ligatures were cut across, it was found that the vein had been included in both. However, the wound was stitched up, and the leg well wrapped up in cotton wool. Not one unfavourable symptom has showed itself since the operation. The sac has suppurated freely, the ligatures came away on the fourteenth day, the wound has almost closed, and at the present time (six weeks after the operation) the man seems perfectly well.

The brachial artery was ligatured for aneurism of the first portion of the radial artery. The patient was a cook on board a steamer, and had aortic valvular disease, but did well.

The lingual was tied for hæmorrhage from the stump of an excised tongue, as has been already mentioned.

The radial was tied a little above the wrist in two cases; in one, for a small punctured wound from a piece of glass; in the other, for a small traumatic aneurism, resulting from a blow received a month before. In this case the tumour gave way, was laid freely open, and the vessel tied above and below.

The ulnar was tied for a punctured wound in the middle part of its course, caused by a knife. The posterior tibial was cut down upon and tied behind the inner malleolus, for hæmorrhage after excision of the ankle-joint, as before related.

There have been two successful cases of *Ovariectomy*. One occurred in a woman, aged 48, who had been tapped five weeks before, and from whom twenty-seven quarts of fluid had been at that time removed. There were no complications in the operation, and the patient went out well twenty-five days after. The other case was that of a woman, aged 30. There were a few adhesions in front. No bad symptoms followed operation. The pedicle was fixed by a clamp, which was removed on the fourth day, and the woman went out well twenty-six days after. There has since then been a case in the Infirmary, in which an operation was attempted, but could not be proceeded with. This was a woman, aged 30, who had been suffering from ovarian disease two years, and had been tapped on two occasions in the Isle of Man. After making the usual incision down through the peritoneum, the adhesions were found to be universal between the anterior part of the tumour and the abdominal walls; the adhesions were very vascular; the tumour was found to be multilocular, and to contain a large quantity of solid material. These circumstances, combined with the fact that the patient took chloroform badly, and seemed to be almost in a state of collapse, caused the operation to be given up. The wound was stitched up. Vomiting came on about forty-eight hours after operation, soon followed by other symptoms of peritonitis, which ended fatally on the fifth day.

Among the cases under the head of "*Removal of Tumours*," there are none requiring special mention. They included examples of various malignant and non-malignant growths, and all did well.

There are two cases of *Vesico-vaginal Fistula* in the list. Of these, one was a large fistula, which was closed after a long and very tedious operation, arising from the size of the aperture and the obesity of the patient. In this case seven silver wire sutures were inserted, of which three were removed on the ninth and the others on the sixteenth day. The patient made a good recovery, without an unfavourable symptom. In the other case, the operation was performed with great ease, and succeeded perfectly, but the patient was seized with symptoms of peritonitis on the fifteenth day, and died. (*Vide* "Deaths after Operation.")

Harelip was operated on successfully in five cases. The ages of the patients were respectively two months, two months, three months, ten months, and ten years. Three were simple cases of single harelip, without other complication; in another there existed a fissure extending from the lip through half the extent of the hard palate; in the other there was a fissure extending through the whole of the hard and soft palates. Any further operation in these last two cases will be left for a future period. In one of the cases harelip pins were not used, the pared edges of lip being brought together by stout wire sutures, which were removed after forty-eight hours. The result was most favourable.

Tenotomy.—In most of the cases for which this operation has been performed, it was for talipes. The tendo Achillis was usually divided in Talipes Varus, also portions of contracted Plantar Fascia. In the after-treatment of these cases the use of elastic cord has been found most successful, exercising a constant and equable force, counteracting the power of the other opposing contracted tendons, and rendering their division unnecessary.

A case of *Ununited Fracture* of the Humerus deserves a few words. It was the case of a healthy farmer, who had sustained a fracture of the humerus, about an inch and a half above the condyles, two years before. There was free movement in every direction when he was admitted. Drilling of the fractured ends was tried on two occasions without success. On the 11th of last December an incision was made on the outer side of the arm, and the ends of the bone turned out and sawn off. The arm was laid on an angular splint, and the man recovered without

an unfavourable symptom. The arm was kept on this splint for about nine or ten weeks, and at the end of that time it was firmly united. About the twelfth week an abscess formed over the site of fracture on the inner side. This was opened, and soon closed up. He left the Infirmary on the 22nd of April, with a good, firm, and useful arm.

Forcible Dilatation of the Urethra for Stricture has been performed in most instances by means of Thompson's dilator. In one or two Barnard Holt's instrument was used. In one of the latter cases death ensued, but this must be attributed to the nature of the case, and not in any way to the instrument used. (The case is referred to further on.) After these dilating and splitting operations, the patients have frequently suffered from severe rigors, and these have, in all instances, been soon relieved by a dose of two or three drops of Fleming's tincture of aconite.

Among the operations under the term '*Various*,' are included small plastic operations, excision or ligation of hæmorrhoids, &c., and all others not mentioned under the previous headings. None of these require observation except one or two, which will be found among the fatal cases.

The following are the cases where *death* occurred after operation :—

Amputation of both Thighs—Exhaustion.—A railway porter, aged 23, admitted with railway crush of both thighs. Amputation of both at the middle third was performed. Sloughing commenced on the fourth, and death from exhaustion ensued on the tenth day after operation.

Amputation of Thigh—Secondary hæmorrhage.—A man, aged 29, suffering from disease of the knee-joint, with profuse exhausting suppuration. Amputation at the lower third of thigh performed. On the seventh day after operation, hæmorrhage came on suddenly from the femoral artery, and although the vessel was immediately secured, the patient died in about two hours.

At a *post-mortem* examination the original ligature was found still adhering to the end of the artery. Ulceration had taken

place just above the ligature, causing a large opening in the vessel, from which the bleeding had proceeded.

Amputation of Thigh—Exhaustion.—A girl, aged 11, suffering from strumous disease of the knee-joint, with considerable implication of the femur. Amputation was performed at the middle third of the thigh. Vomiting commenced almost immediately after the operation, and continued, in spite of all treatment, until the third day, when death occurred from exhaustion.

Amputation of Leg—Pyæmia.—A woman, aged 64, admitted with severe compound fracture of the leg. Strong carbolic acid was applied to the flaps, the wound was closed by wire sutures, and the edges covered with carbolic acid. Phlebitis showed itself four or five days after the operation, and was followed by pyæmia (abscesses in the neck, &c.), which caused death on the tenth day.

A *post-mortem* examination showed a nutmeg liver, pale flabby kidneys, &c.

Amputation of Leg—Exhaustion.—A cork-cutter, aged 40, was admitted for compound fracture of the internal malleolus, with fracture of the fibula. The case was treated by Lister's carbolic acid method. On the third day spreading traumatic gangrene showed itself. Amputation at the knee-joint was performed. The patient sank two days after.

Amputation at Shoulder-joint—Fractured Spine and Ribs.—A slaughter-man, aged 80, knocked down and run over by a train, was brought to the Infirmary with a crushed arm, fractured ribs, and paralysis of the lower extremities. Amputation at the shoulder-joint was performed forty hours after the accident. (The state of the patient would not permit operation at an earlier period.) The man died about thirty hours after, with symptoms referable to the other injuries, dyspnoea, &c.

A *post-mortem* examination showed that the paralysis was caused by a dislocation between the seventh cervical and first dorsal vertebra, the posterior and lateral ligaments being torn through, allowing free lateral movement and crushing of the cord.

Amputation at Shoulder-joint—Embolism.—A farm labourer, aged 20, came into the Infirmary with encephaloid disease of the

right arm, of nearly two years' standing. Amputation at the shoulder-joint was performed by lateral flaps. Little blood was lost during the operation, but in the evening there was rather free bleeding, necessitating the tying of two or three small vessels. The man did well till about fifty-four hours after the operation, when he became restless and delirious. In a short time symptoms of collapse appeared, and in three hours more he died, apparently of syncope.

Post-mortem examination.—The pulmonary artery, right ventricle, auricle, and innominate vein were found filled with firm white clot, which was adherent to the walls of the right ventricle. In removing the heart, this clot was found to extend into the jugular and subclavian vein of the right side. The clot in the subclavian vein tapered almost to a point, and was not adherent to the vein, nor was there any marked redness of that vessel. The walls of the right ventricle were abnormally thin. No other disease was found.

Amputation of Arm—Pyæmia (?).—A blacksmith, aged 50. Amputation of the arm, just above the elbow, was performed for traumatic gangrene of the arm, arising from the bite of a horse four weeks before admission. A sloughing bed-sore formed soon after the operation, followed on the eleventh day by two or three severe rigors. Death ensued on the fifteenth day.

(Pyæmia ?) No *post-mortem* obtained.

Herniotomy — Internal obstruction — Peritonitis.—A carter, aged 32, admitted with a strangulated inguinal hernia. It had been strangulated on a previous occasion, but had been reduced under chloroform. This time all the usual means of relief were tried without avail. Fourteen hours after strangulation the operation was performed. The stricture was at the external ring. Gut, claret-coloured. The symptoms were relieved, and he passed flatus and a good quantity of healthy fæces per rectum five or six hours after, but the vomiting never ceased. Symptoms of a low form of peritonitis soon began to appear, and the sac suppurated. The man died four days after operation.

Post-mortem.—The gut was fully returned within the abdomen. There was peritonitis of a low form. The portion of intestine

which had been strangulated was of a dark purple colour, and covered with lymph. This discolouration extended along the small intestine for about eighteen or twenty inches, and all the bowel above the lately strangulated part was much distended. It was noticed that, just opposite the internal abdominal ring, the intestine was contracted, and on examination it was found that the gut was fixed, by what appeared to be an old band of adhesion, to a part of the abdominal wall, just external to the internal abdominal ring, in such a manner as to interfere with, but not entirely to obstruct, the passage of fæces. The intestine below this was white, contracted, and free from any appearances of inflammation. On slitting up the gut, the line of demarcation between the distended congested, and the pale contracted, portions was most marked. It appeared probable, therefore, that the patient's death was due to this internal obstruction of the intestine.

Herniotomy — Peritonitis.—A woman, aged 40, admitted suffering from strangulated femoral hernia of five days' duration. Herniotomy was performed within three hours of her coming to the Infirmary, at which time she had already symptoms of acute peritonitis. Vomiting ceased for several hours after the operation, and the bowels were relieved in the course of the next day, but in a short time the peritonic symptoms became worse, and the patient died on the sixteenth day.

Herniotomy — Gangrenous Intestine — Peritonitis.—A woman, aged 49, admitted with strangulated femoral hernia of two or three days' duration. (The period of strangulation uncertain.) The gut was found gangrenous, laid open, and the edges stitched to the sac. The symptoms were but slightly relieved by the operation, and the patient died of peritonitis on the fifth day.

Lithotomy — Peritonitis.—A man, aged 37, admitted with vesical calculus. (Duration of disease uncertain.) He was very anæmic. He had a very irritable and thickened bladder, and the urine contained pus, consequently it was considered that lithotripsy was inadvisable. Lithotomy was, therefore, performed by the lateral method. Considerable difficulty was experienced in finding the stone, and the operation rendered tedious, in con-

sequence of the great depth of the perineum, and also from the prostate gland being disorganized by abscess. A small calculus was removed. Vomiting commenced soon after the operation, and symptoms of peritonitis appeared, and increased rapidly till the third day, when the patient died.

(This case, together with the *post-mortem* appearances, will be noticed by Mr. Bickersteth, in another part of this volume.)

Tracheotomy—Broncho-pneumonia.—A girl, aged 7 months, admitted with urgent symptoms of croup, of two or three days' duration. Was much exhausted by diarrhoea, which had continued for a week or ten days before her admission. Tracheotomy was performed two hours after she was brought to the Infirmary. She was much relieved by it, and improved considerably for about twenty-four hours, when dyspnoea again came on, and in an hour or two she died, with symptoms of asphyxia, probably from broncho-pneumonia. There was no obstruction in the canula, nor in the trachea.

No *post-mortem* examination was allowed.

Trephining—Abscess of Brain.—A woman, aged 28, admitted for scalp wound on the right side of the head, over posterior inferior angle of the parietal bone, with *slight* symptoms of compression. No fracture to be felt. Ten days after admission, she had convulsive movements of the right extremities, and paralysis of the left. Trephining was performed. No depressed bone was found. No injury of the dura mater. The convulsions ceased, and she improved for about thirty-six hours after the operation, when the symptoms returned, and she gradually became worse, until she died, eighteen days after.

At the *post-mortem* examination, there was found a fissure of the parietal bone about five inches long, running along the lower part of the opening made by the trephine to the base of the skull. No depression of bone. There was general meningitis; an abscess in the substance of the right hemisphere; and the right lateral ventricle was full of purulent fluid. Pus was found between the dura mater and cerebellum. Left hemisphere healthy.

Trephining—Erysipelas of Arm—Pneumonia.—A man, aged

24, was knocked down by an engine. On admission, he had a severe compound comminuted fracture of the skull. Trephining was at once performed. A considerable quantity of bone was removed. The man improved considerably for three or four days, and was conscious and sensible. One of his thumbs had been much crushed by the engine. Consequent upon this injury, a low form of erratic erysipelas of the arm set in. After he had been in the Infirmary some five or six days, symptoms of pneumonia appeared, and he died about twelve days after admission.

No *post-mortem* inspection was obtained, but it seemed probable that death was caused by the pulmonary affection, for the only symptom referable to the head was delirium. There were no other symptoms of mischief in or about the brain.

Ligation of Carotid Artery—Suppuration of Sac—Exhaustion (Pyæmia ?).—A woman, aged 42, admitted for aneurism of the upper part of the left common carotid artery. She was suffering from syphilitic cachexia, and the tumour was increasing. There were no complications during the operation, but there was from the first an inactive and unhealthy state of the wound. The ligature came away three weeks after the operation, and about the same time the sac became inflamed, and afterwards discharged pus through the lower part of the wound, where union had not yet taken place. She then began to have frequent attacks of colliquative diarrhœa, accompanied by hectic febrile symptoms, and rapidly became weaker. About sixty hours, and again about forty-eight hours, before death (which occurred on the thirty-eighth day), there was slight arterial hæmorrhage from the wound.

Post-mortem inspection.—The artery had been secured about an inch below the sac. The artery below the point of deligation contained a moderately firm plug of fibrine, but none was observed above this point, nor was there any adhesion of the vessel between the place of deligation and the sac. The sac was almost empty. At the upper part of it there was a small reddish mass of clot. This, which appeared to have shut off the distal end of the artery from the sac, was not all of the same consistency, being much softer in some parts than in others. It was supposed, in consequence, that part of it had been recently dis-

turbed, and a fresh quantity deposited, and that the bleeding had come from this source. (The quantity of blood lost on each occasion did not exceed an ounce and a half.) The brain was softened, more especially about the *right* corpus striatum and thalamus opticus.

No further examination of the body was permitted, but it seems very possible, from the state of the patient during the two or three weeks before her death, that she died of pyæmia.

Excision of the Shaft of the Tibia—Exhaustion.—A girl, aged 8 years, admitted with acute necrosis of the whole shaft of the tibia. She was a very delicate strumous child. The operation was performed with very little difficulty. Within twenty-four hours after, there was free bleeding, which was found to proceed from a vessel in the interosseous membrane. The child never satisfactorily rallied after the operation, and sank from exhaustion on the sixth day.

Vesico-vaginal Fistula—Peritonitis.—A woman, aged 22, admitted for vesico-vaginal fistula of two months' duration. A week after admission, the usual operation was performed. It was completed in twenty-five minutes. Five sutures were introduced. These were removed on the 9th day, when the wound was found to be perfectly united. The patient sat up on the fourteenth day, and could retain her urine perfectly well. On the sixteenth day after operation, she got up early in the morning, and remained out of bed for more than an hour, and soon after returning to bed had a rigor; shortly after this, pain in the abdomen supervened, and in a short time symptoms of peritonitis showed themselves. These increased, peritonitis became general, and ended fatally in five days. Soon after the first onset of this attack, the use of the catheter became necessary, but not a drop of urine was passed per vaginam.

Post-mortem.—On laying open the abdominal cavity, general peritonitis was observed, with purulent effusion. The uterus was large, apparently from imperfect involution, and within its cavity was a small coagulum. On section, its structure seemed healthy, but there was much congestion of its mucous membrane. The fallopian tube of the right side, together with its fimbriæ,

was enlarged and congested, as was also the ovary of the same side. The fistula was perfectly united. The remaining viscera were normal.

Excision of Cancerous Gland—Erysipelas.—A man, aged 70, (who had had several operations performed on him for epithelioma of the cheek, and different secondary deposits in the face and neck,) was admitted for a cancerous gland deeply situated in the upper part of the neck, near the base of the tongue. This gland was removed by an incision below the chin. In a day or two erratic erysipelas showed itself, followed by formation of pus, (which burrowed deeply among the muscles of the neck,) and hæmorrhage. The man died on the eleventh day after operation. (This case is placed among the “*Various*” operations.)

Epithelioma of Vulva—Excision—Pyæmia.—A woman, aged 66, was admitted for a large epithelioma of the vagina and fourchette. This was excised. The wound had almost healed, when, twenty-two days after the operation, swelling and tenderness of the inner and upper part of the left thigh was noticed, accompanied by vomiting and other constitutional symptoms. In a few days more she became jaundiced, and died six weeks after the operation, with all the symptoms of pyæmia. No *post-mortem* inspection was allowed.

Foreign body in Bladder—Acute Cystitis.—A man, aged 80, had broken a piece of gum elastic catheter into his bladder, eleven months before coming to the Infirmary, and for some weeks had been suffering much pain and uneasiness. On admission, he had symptoms of acute cystitis, and also of nephritis, was constantly passing urine mixed with blood, mucus, and pus, and had severe constitutional symptoms. As he was rapidly becoming worse, Allarton’s operation was performed. A piece of catheter, four inches in length, twisted up and covered with phosphatic deposits, was removed; but the patient received no relief therefrom. He died on the eighth day. No *post-mortem* examination allowed.

Forcible dilatation of the Urethra—Peritonitis.—A man, aged 29, admitted with stricture of the urethra of four years’ standing. He contracted syphilis about four years ago. On admission, he had numerous false passages, and also four or five fistulæ in the

perineum and nates, through which urine and fæces passed. After being in the hospital for a considerable time, forcible dilatation with Holt's instrument was performed. The man became rapidly worse, and died on the third day after operation.

At the *post-mortem* examination, commencing acute peritonitis was found. There were fistulæ running from the urethra to the rectum, and to the perineum, and from the rectum into the pelvic cellular tissue. The whole of the cellular structure between the bladder and the rectum was disorganised from old inflammation, and riddled with sinuses or cavities containing purulent fluid; and this state of affairs existed in front of and round the rectum, even above the brim of the pelvis. Some of these sinuses were only separated from the peritoneal cavity by that membrane itself. It seemed probable that the dilator had passed into one of the fistulous tracts, and had thus set up acute inflammation in parts previously disorganized.

Division of Cervix Uteri—Peritonitis.—A woman, aged 37, admitted for fibrous tumour of the uterus, and severe dysmenorrhæa. Division of the cervix was performed by Simpson's Hysterotome. She began to complain of pain in the region of the uterus, soon after the operation; pain and tenderness soon extended over the abdomen, and death from peritonitis ensued four days after.

At the *post-mortem* examination, the cervix was found fairly divided, but the incision did not extend more deeply than usual into its substance. There was inflammatory redness of this part, extending to the adjacent peritoneum. There were all the usual appearances of general acute peritonitis. The uterus contained a fibrous tumour, about the size of a hen's egg. (This case is placed among the "*Various*" operations.)

CLINICAL ENQUIRY INTO THE RESULTS OF HAN-
COCK'S OPERATION, OR THE DIVISION OF THE
CILIARY MUSCLE, IN CERTAIN SERIOUS DEEP-
SEATED AFFECTIONS OF THE EYE.

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Two operations have lately been brought before the profession for the relief of certain deep-seated affections of the eye, attended with serious injury to the sight, if not even total loss of vision. These are iridectomy, and the division of the ciliary muscle; which last is often called Hancock's operation.

The diseases for which these operations have been proposed are various, but all agree in being attended with pain, and fullness or tension of the eye-ball; and with more or less deep-seated inflammatory action which rapidly affects the sight, so as to produce partial or total loss of vision. The most formidable of these diseases is glaucoma, acute or chronic; and the most common of them is rheumatic inflammation, affecting first the sclerotic, and then the iris and deeper tissues, until at length vision is almost entirely gone.

The first of these operations results in a permanent loss of a portion of the iris, and cannot be regarded otherwise than as grave and important in its nature. The second generally leaves no visible traces beyond a cicatrix at the margin of the cornea, which is so slight as to require careful examination for its discovery; though it sometimes results in an oval instead of a

circular pupil, and in some rare instances in a slight prolapsus of the margin of the iris, which produces a small dark spot at the junction of the sclerotic with the cornea. The first operation (iridectomy) necessitates confinement to bed for a time, and other accompaniments of an important operation, whilst the second (Hancock's) is so slight, in comparison, that the patient may generally be allowed to return home at once from the Hospital or the consulting-room.

The object of both operations is the same, viz., to remove the intra-ocular pressure supposed to exist between the lens and the retina, by which the nervous system of the eye is paralysed, if not ultimately disorganised, and atrophied.

The praises of iridectomy, and the necessity for its performance, have been prominently brought before the profession; and nothing need be added on that score; but although Hancock's operation has not been without its advocates, it has not become so generally and favourably known; and for one who has heard of division of the ciliary muscle twenty have heard of iridectomy. If, however, the simpler operation is capable of giving efficient relief in these cases, it is manifestly a gain to possess a simple operation unattended by permanent injury to any portion of the eye, as a substitute for a formidable, however successful one, which is essentially dependent upon the removal of a considerable portion of so important an organ as the iris; and the object of the following paper is to relate a series of cases in which the minor operation was tried, in order to test its value. It may be right to add that the enquiry was undertaken with the hope that the simpler operation might prove successful, though without any prejudice against the more serious one of iridectomy, if experience should prove that it must be our first operative treatment, instead of being a measure that may safely be postponed, until the other has had a fair trial in any particular case.

As the tests frequently referred to are the types now universally adopted by ophthalmic surgeons, but not generally known to the general practitioner, they are here printed for convenience of reference.

- No. 2. at the foot of a sloping hill.
 No. 4. the dishes, plates, and coppers.
 No. 6. fit to keep up.
 No. 8. my son and me.
 No. 10. which we had lost.
 No. 12. to read the.
 No. 14. how well so-ever.
 No. 16. **provisions**
 No. 18. **general**
 No. 19. **team**
 No. 20. **Sun**

CASE 1.—*Complete loss of vision in right eye—rapidly failing sight in left, constant pain, with no visible external indications of blindness.*

Miss P., aged 48. History.—Thought her sight was failing from advancing age, and began to use spectacles; but found that first one type and then another became invisible, until at length she could not read the largest print she could procure, in a bible or prayer-book. Had constant pain in the eyes, which kept her

awake at night from its severity. Duration of case, a few months. Had been treated for neuralgia and hysteria, as there was no visible sign of local mischief, no inflammatory redness, dulness of cornea, or irregularity of pupil.

Condition when first seen.—Both eyes to all appearance healthy, on a mere external examination; globes tender on pressure, and tense; pupils yielded to atropia, and dilated regularly.

Right eye.—Optic disk almost invisible; vitreous turbid, and filled by numerous striæ, resembling a cobweb. *Left eye*, similar condition, but to a slighter extent.

Right eye.—Quite useless, had no distinct vision of large objects in the streets, could not distinguish the letters of No. 20. Divided the ciliary muscle, and ordered small doses of turpentine, with poppy fomentations. She returned the same day to her residence at a distance, but in a week visited me again; the pain was less, and she was able to sleep, and could now read No. 20, but not No. 19. Three weeks after this, the same operation was performed on the left eye, and as her health was feeble she was ordered a tonic. In another month she again visited me, and the following is the memorandum in my Case-book: "Since the division of the ciliary ligaments, she has been entirely free from pain in her eyes, which formerly kept her awake at night from its severity, and she can now read small print for three hours without glasses, while she could not read the largest print with glasses before the operation. Very slight appearance of spots or cobwebs. Four months after this she visited me again, the left eye continued healthy, and the right eye free from pain, and she could read No. 19 with it; and when dilated by atropia, she could read No. 18. But the lens was becoming slightly cataractic." Since that time (four years since), I have not seen her.

CASE 2.—*General Inflammation of all the Tissues.*

Joseph C., aged 49. About twelve months since he received a blow on one eye, which caused partial loss of vision, without much pain. In a few weeks the sight was perfectly restored, after the application of three or four blisters.

Three weeks since had a bad cold, and whenever he coughed,

flashes of fire went through that eye. He had no pain in the eye itself, but a little in the forehead, and there was no visible inflammation of the eye. In two or three days the sight began to fail, and six days since the eyes began to inflame and became rather painful. From this time the case became worse, but there was not severe pain.

Condition when seen.—Cannot read No. 20, anterior chamber distended, and iris pressed back by semi-opaque aqueous humour. Iris hazy; vitreous turbid; conjunctival inflammation so considerable as to hide the sclerotic entirely. The ciliary muscle was divided, and poppy fomentations and a purgative were ordered. The operation was attended by great pain. Next day he was free from pain, and could read No. 18. The iris was less hazy, and the anterior chamber was natural in appearance and extent; conjunctival inflammation still very great; poppy fomentations and belladonna dilated the pupil, and the case progressed favourably under simple treatment from that time. In a short time he was able to resume his occupation as an engineer in a steamer.

CASE 3.—Inflammation advanced to the formation of pus in the anterior chamber.

The notes in this case are very brief.

G. H., aged 80. Could barely see his hand. Sleepless from pain for three weeks. Hypopion barely commencing. Divided the ciliary muscle.

On the second day, "not like the same man. Can sleep easily."

On the fourth day, "can see objects easily across the room."

I have no further notes of the case. If the progress had been unfavourable, they would have been continued. The constitutional treatment consisted of the application of belladonna to the eye, and minute doses of bichloride with 15-grain doses of cinchona bark three times a day.

CASE 4.—Rheumatic Inflammation of Right Eye.—Almost total loss of vision.

Mrs. H., aged 80. Had suffered from rheumatic inflammation

for above a fortnight when she consulted me. Had received ordinary appropriate treatment from a skilful surgeon during this time.

Condition when seen.— Could not distinguish a man from a woman. Incessant pain, which had kept her awake day and night for several days. Globe tense, and acutely tender on pressure. Cornea hazy. Sclerotic inflammation. Pupil irregular, and had resisted all attempts to dilate it by belladonna. Disk perfectly invisible, from the turbid, opaque condition of the vitreous. Health broken. *Divided the ciliary muscle*, and applied poppy fomentations, with belladonna, and other treatment similar to what she had previously used.

She slept comfortably that night, and the next morning was almost free from pain, and the pupil was beginning to dilate. It was still very irregular. The following day she could distinguish my features, and she gradually improved from this time. She can now see to read No. 6.

CASE 5.— Rheumatic Inflammation, with almost total Loss of Vision, in a previously diseased eye.

Mr. C., aged 47. Has been the subject of several attacks of rheumatic inflammation in both eyes, which had produced adhesions of the iris, and a permanently irregular pupil in the right eye, with imperfect vision, though he could still read with difficulty. An attack this spring was more than usually severe, and the pain deprived him of rest, and seriously affected his health. He had obtained so much relief last year from the pain and other serious symptoms, by the division of the ciliary muscle in the left eye, that the operation was strongly urged upon him for the right eye, but he shrank from the thought of an "operation," "cutting, &c.," and would not consent to it until his strength had failed considerably, and his sight was so much affected, that when looking at my face he could merely see that there was something in front of him. After the operation he never had a return of the previous severe pain, and was able to sleep at night. His pupil yielded considerably to the action of atropia, and his general symptoms improved. The restora-

tion of sight was very gradual, and he took iodine, quinine, &c., for some weeks. At the end of about two months he could tell the time by the seconds hand of his watch, and his condition was similar to what it had been previous to his attack.

CASE 6.—*Sclero-iritis, with great injury to vision.*—*Chronic case.*

Eliza L., aged 24. Had been suffering for a month before admission to the Eye Infirmary, but had had no treatment whatever, from carelessness on her own part alone.

Condition on admission.— Cannot distinguish one person from another. Pain in eye severe, somewhat intermitting. Subject to exacerbations. Zonular ring of inflammation surrounding the cornea. Iris hazy. Pupil fixed. Anterior chamber distended. Divided ciliary muscle, and, for the sake of observing its effects, no other treatment of any kind was ordered.

Next day much less pain. Can see my face better, but not well. Less zonular inflammation. Pupil dilating; irregular.

Being satisfied with the result of the operation, I now ordered belladonna and iodide of potassium.

In three days the pupil was dilated, and nearly regular, and she could see the hour by a clock, and read No. 14 with difficulty.

The treatment was continued, and the case terminated favourably.

CASE 7.—*Rheumatic Iritis.*

Bridget M'C., aged 35. Had been for three weeks under ordinary treatment, with no beneficial result.

Condition when seen.— Ordinary appearances of rheumatic iritis. Cannot see whether a piece of paper is plain or printed. Divided the ciliary muscle, and continued treatment similar to that previously used. She attended at the Eye Infirmary again in three days, and was free from pain, and could see which was the printed side of the paper easily. The following week she could see whether the print was right side up or not. In eleven days she could see No. 12 distinctly, but not read it; but in three days more she could read No. 10, and was still free from pain; and the case gradually continued to improve.

CASE 8.—*Disease of all the deeper tissues, and extreme loss of sight, with little or no pain.—Improvement less marked than in the former cases.*

M. E. H., aged 16. Delicate strumous-looking girl. Had been troubled with inflammation of a slow languid character for about three weeks, and in spite of treatment had been getting worse.

Condition.—Cannot tell a man from a woman. Zonular inflammation. Cornea and iris hazy, and pupil irregular. Vitreous turbid and lost its transparency. *Little or no pain*, and little tension of globe. Divided ciliary muscle, and continued the same treatment as before.

In three days she could see the patients in the visiting-room, and could tell whether the hand was open or shut, but could not even see that No. 20 was separate letters. Still no pain. In a week she “sees a little clearer,” but still very imperfectly. Optic disk totally invisible, through the opaque and brown-coloured vitreous.

GENERAL CONCLUSIONS.—The foregoing are not picked cases, but they have been taken as they presented themselves in practice. Cases of minor severity, in which the operation has been performed as a precautionary measure, have not been introduced. And those cases have not been mentioned in which it has been performed in the hope that it might possibly supersede the necessity for iridectomy, but in which the hope has not been fulfilled, but this operation has still been necessary. Such cases have been but few, and the patients have not been worse off in consequence of the proceeding, and they have had the chance given of being saved the more formidable operation.

The cases reported above have been generally of a very grave character. The loss of vision has been extreme in some instances, and considerable in all, and the pain has generally been to an urgent degree. They have not been styled “glaucoma” in their titles, as this name has been the subject of so much controversy, that I have preferred describing the parts of the eye affected, and the symptoms, to using a term of disputed meaning. Some

of the cases might, however, have been properly termed glaucoma and others have been aggravated cases of rheumatic affection. It may be noted that the case in which the smallest amount of benefit was derived was the last of the series, and it was distinguished from all the others by the marked absence of pain. Sluggish strumous degeneration of the eye was its chief characteristic; and whilst those cases in which pain and rapid loss of vision were prominent features, were benefited to a degree beyond our earlier expectations, this, in which pain was absent, and there was no appreciable tension of the globe, was improved in a very minor degree.

The operation itself is often, perhaps we may say generally, accompanied by an amount of pain, for which it is difficult to account; and it is sometimes three or four hours before this pain subsides; but when it does cease, the sleep succeeding the operation the first night, and the freedom from return of pain, are well-marked results of the operation.

The operation generally leaves little or no mark of its having been performed, but if there is much straining on the part of the patient, by holding the breath or otherwise, a minute portion of iris sometimes protrudes in the wound, and a slightly oval pupil is the result. I have seen the accident occur sufficiently often to show that care must be taken to guard against it; but no permanent disadvantage arises from it, beyond the slightly altered figure of the pupil.

On the whole, the result of the operations has been so decidedly favourable as to raise this mode of treatment to a high position in the estimation of my colleagues in the Eye Infirmary, as well as in my own; and these Cases are published in the hope that they may promote our knowledge of a valuable and simple operation, which may be substituted, in a large proportion of cases, for the more serious one of iridectomy.

CONTRIBUTIONS TO PRACTICAL MIDWIFERY,

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CASES ILLUSTRATIVE OF THE USE OF THE FORCEPS.

IN a short treatise, published in the early part of the present year, I ventured to bring before the notice of the profession the principal arguments in favour of an earlier and more frequent recourse to the forceps, than is recommended or sanctioned by the greater portion of the standard authorities on Midwifery, in those cases in which labour is either inordinately prolonged, or in which there is reason to believe that it will prove tedious, although none of the symptoms may have yet appeared which have been held to be essential indications for instrumental interference. I also expressed my decided preference for the long over the short forceps in all cases, and in every position of the child's head, and especially insisted upon the importance of adopting the form of instrument constructed on the principles of those known as Ramsbotham's, Roberton's, or Simpson's long forceps, having the pelvic as well as the cranial curve, and, what is equally essential to their complete efficiency, parallel shanks in front of the lock, affording the two-fold advantage of bringing the lock entirely clear of the vulva, and thus avoiding all risk of including the hair of the pubis or the soft parts of the mother in its grip, and at the same time preventing that forcible distention and stretching of the passages, which must always be caused, to a greater or less extent, by forceps in which the blades spring directly from the lock. I have observed with much

satisfaction that these points, regarded by me as indispensable in the proper construction of the midwifery forceps, have received the sanction of so high an authority as Dr. Barnes, in his Lectures on Obstetric Operations now in course of publication in the *Medical Times and Gazette*, and in which he indicates his high appreciation of the forceps, by speaking of it as the "noblest of all obstetric instruments."

The following Cases, selected from the records of my private and consultation practice, and from those occurring in the Ladies' Charity, all within the last twelve months, will serve to illustrate practically some of the points which I have already advocated theoretically in my former paper. It will avoid repetition to state here, that in all the cases the forceps used was that recommended by Dr. Roberton, and that the patients were all kept under the full influence of chloroform during the operation.

CASE 1. — Lingering Primiparous Labour — Forceps delivery before full dilatation of os uteri — Result favourable to mother and child.

Mrs. R., aged 25. Labour commenced on the 25th of August, 1866, about six p.m., and slowly progressed until the evening of the following day, when I found that the membranes had ruptured some hours previously, the os uteri was about one-half dilated, the anterior lip having descended in front of the head, which was presenting in the first position, and engaged in the brim. During the next three hours the pains, although regular, were deficient in propulsive action, and no perceptible progress was made. I cautiously introduced the forceps, guiding the blades carefully within the os uteri, and proceeded to deliver, slowly and gradually, using traction at intervals corresponding with uterine action. At 11.30 p.m., about thirty-one hours from the commencement of labour, a living female child was extracted. The patient made a good recovery.

Remarks.—This case affords an illustration of the fallacy in the teaching of those who insist upon full dilatation of the os uteri as an essential condition in the application of the forceps, on the ground that it is hazardous to pass the blades within

the uterus. If such a rule were followed, the use of the instrument would be necessarily forbidden in a wide range of cases, especially in primiparæ, until, by delay, the patient must have passed the confines of safe labour.

CASE 2.—*Multiparous Labour slightly obstructed by a minor degree of disproportion—Forceps delivery, with favourable results to mother and child, especially as contrasted with unaided labour in the same patient.*

Mrs. R., in labour with her fifth child, on 14th October, 1866. I delivered this patient of her first child with the forceps, having waited much longer before interfering than I have since been accustomed to do; the difficulty then, as on the present occasion, depended upon slight disproportion, the child, a male, being large, and the pelvis, though well formed, was somewhat below the standard capacity. The father was a very tall bulky man, the mother small, and of low stature. Her convalescence was prolonged and unsatisfactory; she had paralysis of the sphincter of the bladder for several days after delivery, and did not fully regain her strength for several months. Her three subsequent labours were tedious and prolonged, her sufferings considerable, and her recoveries, though finally complete, were protracted beyond the usual period. Bearing in mind these points in her history, I resolved on the present occasion not to allow her to remain undelivered longer than could be avoided; accordingly, as soon as the second stage of labour had fairly set in, and before the head had fully entered the cavity of the pelvis, I watched the effects of the pains closely, and finding that, notwithstanding the vigorous action of the uterus, little or no progress was made, and as the patient already expressed much anxiety to be relieved, I applied the forceps, the head still being high up in the pelvis, and delivered her of a living male child in less than an hour. Her recovery was perfectly satisfactory, affording a striking contrast to the result of her three preceding labours, which were conducted on the now nearly obsolete principle of non-interference except in extreme cases, and of her first

delivery, in which assistance was unnecessarily, and I believe injuriously, delayed.

Remarks.—This case affords a comparison of the results of two opposite methods of managing labour in the same patient; it is also an example of the superiority of the long over the short forceps. Delivery with the latter at the stage described, would have been extremely difficult, if not impossible, and consequently, if used at all, their application would have involved considerable delay, with the inevitable risk of giving rise to those unfavourable conditions which it is the express object of instrumental aid to avoid.

CASE 8.—Primiparous labour, simply tedious—Forceps delivery—Result favourable to mother and child.

Mrs. W., aged 25. Rather a delicate woman, taken in labour on the 1st December, at six p.m., progressed regularly and favourably for about eleven hours, when, the head having become fully engaged in the cavity of the pelvis, further progress was almost completely arrested. I then applied the forceps, extracted a full grown living female child, delivery being completed at 7.30 a.m. on the 2nd, namely within fourteen hours from the commencement of labour. Convalescence was slightly interfered with by ephemeral fever, but was otherwise satisfactory.

CASE 4.—Second labour—arrest from slight disproportion—Forceps delivery—Result favourable to mother and child.

Mrs. W., aged 22, an undersized but well-made woman. Her first labour, although tedious, was completed without instruments. She was taken in labour, for the second time, on 17th of April, at two a.m. I visited her shortly after, and found the head presenting in the first position, engaged in the cavity of the pelvis; uterine action was strong, yet insufficient to overcome the obstacle. I applied the forceps, and found that strong extractive efforts, and considerable time, were required to effect delivery. The child, a large living boy, was born at 10.30 a.m., within nine hours from the commencement of labour. The patient made a good recovery.

Remarks.—The two foregoing cases illustrate a principle in practice which I am anxious to enforce, and which may be said to constitute one of the essential differences between the rules of practice inculcated by Denman and his followers, and those later views, as to the use of instruments, which are daily becoming more and more generally recognised by accoucheurs of the present day. The forceps was applied in the absence of any decided symptoms indicating the necessity for immediate delivery, and where, very possibly, the delivery might have been effected without its aid. The grounds upon which the propriety of artificial delivery in such circumstances founded, are—

1st. The axiom in midwifery, that the duration of labour, beyond a moderate period, is, *per se*, an element of danger, and one which produces a more or less unfavourable effect upon the subsequent recovery of the patient.

2nd. That experience and observation, in many cases, enable the accoucheur to predict with tolerable certainty that the labour will prove unusually protracted, and thus to anticipate the unfavourable complications which so frequently result from delay, and by waiting for the actual appearance of which, the chances of a favourable result are greatly diminished.

3rd. That when it appears probable that the forceps will be required to complete labour, the facility with which they can be applied, and the safety of delivery, as regards both mother and child, materially depends upon its employment at the earliest period of the labour, at which its use is admissible.

CASE 5.—Multiparous labour—attended by a Midwife—face presentation—Forceps delivery—Favourable result to mother and child.

A widow, aged 35, commenced in labour at five a.m. I saw her at ten a.m., found the face presenting, pains had been very violent for some time without causing any advance, and leading the midwife (an experienced woman) to fear rupture of the uterus might occur. I applied the forceps over the sides of the posterior portion of the head, which was just beginning to engage the

hollow of the sacrum, and by a lever action with scarcely any downward traction I caused the occiput to sweep the curve of the sacrum and distended perineum; the chin at the same time ascended over the posterior surface of the pubis, and delivery was completed with ease in a few minutes. The child, a male, was alive, but presenting a hideous appearance, from swelling and discolouration of the forehead and side of the face, all of which however rapidly disappeared. The mother did well.

Remarks.—This mode of delivery differs from that usually recommended in face presentations. Some accoucheurs prefer the vectis, an instrument I have entirely discarded from my own practice, as in my opinion less dependable, and not so safe as the forceps. We are advised by others to content ourselves with assisting the rotation of the face forwards by making traction, with the fingers placed in the child's mouth; a manoeuvre which will doubtless succeed in many cases, and is founded on correct views of the mechanism of this form of malposition; but in the present case immediate delivery was called for, by the powerful action of the uterus threatening rupture, and increasing every moment the risk to the child; and the plan adopted effected this object with ease, promptitude, and safety, to both mother and child.

In each of the seven cases which follow, the child was still-born, being I believe in most, if not in all of them, sacrificed to delay, the forceps not having been used in a sufficiently early stage of labour. They illustrate a point in practice which has scarcely received the attention which it deserves,—namely, the safety of the child as an element of consideration in deciding upon the propriety of artificial delivery.

CASE 6.—Primiparous labour—Tedious throughout from deficient action—Forceps delivery—Result favourable to mother—Child born asphyxiated, from long continued pressure—Recovery rendered hopeless by immediate separation of placenta.
This patient was 30 years of age, of a delicate constitution, with

phthisical tendency. Labour commenced on Saturday, at four p.m., membranes ruptured at eight the same evening, from this time uterine action gradually decreased, and after some hours almost entirely ceased. Her medical attendant suggested the propriety of affording artificial aid, but the patient for some time obstinately refused her consent, at six o'clock on Sunday morning, labour having lasted for about twelve hours, my assistance in consultation was requested. With some trouble we prevailed on the patient to submit to the use of instruments. She was put under chloroform, and I applied the forceps to the head, which was firmly wedged low down in the pelvis. Extraction occupied nearly an hour, and required strong traction. The child, a full grown male, was asphyxiated, and although the heart's action was distinctly felt, all the usual means, including galvanism, persevered in for a considerable time, failed to excite respiratory action. The placenta was thrown off immediately, and had probably become detached before the birth of the child was completed.

Remarks.—In this case, the child's life was probably sacrificed to delay, for which, however, the patient herself was mainly responsible. The premature separation of the placenta no doubt greatly diminished the chances of resuscitation.

CASE 9.—Primiparous labour, attended by a Midwife, protracted from undue rigidity of maternal passages—Child still-born—Laceration of perineum—Mother recovered.

This woman was 30 years of age, stout, large limbed, and rather corpulent; she had been in labour for twenty-four hours; the head was still impacted high up in the pelvis, where it had remained stationary for several hours. The passages were so rigid and undilatable, that the hand could not be passed into the vagina without considerable difficulty. The sounds of the foetal heart were feeble and indistinct. Chloroform having been administered by an assistant, I applied the forceps, and with considerable exertion extracted a full grown female child, quite dead. The soft parts were so rigid and indistensible, that, in spite of every precaution, a slight laceration occurred at the anterior border of the perineum, during the passage of the head, which was still further extended

by the expulsion of the shoulders. The sphincter ani, however, escaped. Immediately after delivery, I brought the edges of the wound together with silver wire sutures, it healed satisfactorily, and the woman made a good recovery.

CASE 8.—Multiparous labour, protracted from slight disproportion—Attended by a Midwife—Forceps delivery—Child still-born—Mother's recovery favourable.

This was a third labour, the two previous ones having been difficult. The child, a full grown male, was quite dead, having doubtless perished from continued compression, which the moulding of the head showed to have been considerable. Labour had been going on for many hours before I saw her.

CASE 9.—Primiparous labour, attended by a Midwife—Forceps delivery—Child still-born—Mother recovered.

When I saw this woman, she had been in labour many hours, the head having rested low in the vagina for some time; there was an olive coloured discharge from the passages, but the patient, although worn out and anxious, had no alarming symptoms; the midwife had given ergot. Delivery was accomplished quickly, and without difficulty, but the child was quite dead.

CASE 10.—Primiparous labour, attended by a Midwife—Protraction from uterine inertia—Forceps delivery—Mother saved—Child still-born.

The woman was 19 years of age, and had been in labour eighteen hours. Head presented in the first position. I applied the forceps, and, after much time and difficulty, extracted a female child, quite dead. Mother recovered favourably.

CASE 11.—Multiparous Labour, attended by a Midwife—Protraction from uterine inertia—Occipito-posterior position, the 4th of Naegelè.—Forceps delivery—Mother saved, child still-born.

The patient was a poor Irish woman, living in one of the worst parts of the town; the mother of nine children; she had been in

labour nine hours; the head was lying low in the pelvis in the fourth position; labour had been tedious throughout, the pains having latterly almost disappeared. I delivered her with the forceps easily in a few minutes. The child, a full-grown male, was quite dead. The uterus was large and doughy for some time after delivery, but no hæmorrhage occurred. Recovery favorable.

CASE 12.—Second Labour, attended by a midwife—Arrest of head from narrow outlet—Forceps delivery—Mother saved, child still-born.

The woman, aged 23, was short and square built, with broad hands and large joints. Her first labour was said to have been good; the child, a female, born alive.

The membranes ruptured ten hours before my arrival; pains continuing strong, but for the last three hours no progress had been made. I found the head lying in the transverse diameter of the pelvis, rotation not having been effected, and further descent impeded by the projection inwards and undue thickness of the ischial spines. The soft parts below were much tumefied, several small thrombi had formed on the nymphæ, and one on the posterior wall of the vagina, indicating the existence of great and continued pressure of the parts above. I found more than usual difficulty in adjusting the forceps, but after persevering cautiously I succeeded in obtaining firm hold. Extraction occupied about an hour and a half, and required the application of considerable force. The child, a male, was quite dead. The moulding of the head indicated a high degree of compression. The mother recovered without a bad symptom.

The five following and concluding cases of the series might seem, at first sight, to prove the safety of delay. In all of them labour had been considerably prolonged before the forceps were used, and in all the result was favourable both to mother and child. But it must be borne in mind that in four out of the five there was no disproportion, and, therefore, the compression of the head in its passage through the bony ring of the pelvis was at no

period excessive. These and other favourable conditions cannot always be known beforehand, or calculated upon in a given case of protracted labour, and therefore an occasional favourable issue, where interference has been unduly postponed, should be regarded as a fortunate escape, rather than as a result to be confidently expected. In the one case, in which slight disproportion existed, the forceps were applied before the head had fully engaged in the brim, and the danger of prolonged and extreme compression was thus avoided.

CASE 13.—Multiparous Labour, attended by a midwife.—Head arrested by rigidity of os coccygis—Result favourable to mother and child.

This patient had been delivered two years previously with the forceps by another practitioner. On this occasion, she had been in labour about ten hours, all having gone on satisfactorily until the head reached the outlet, where it was detained by rigidity of the os coccygis. I applied the forceps, and cautiously extracted a living male child. The mother did well.

CASE 14.—Multiparous Labour, attended by a midwife—Delay from malposition, face to pubis—Forceps unsuccessful—Cephalic version—Mother and child saved.

This woman was 39 years of age, and the mother of eleven children. Previous labours good. She had been in labour nine hours; the pains were vigorous, but the head did not advance. The pelvis was roomy, and the sole cause of delay was the occipito-posterior presentation. I applied the forceps laterally, and succeeded in extricating the head from its fixed position, but the forceps showing a tendency to slip, I removed the blades, introduced my hand, and with the greatest ease changed the position of the head into the occipito-anterior position. Nature completed the process, and a living male child was born in a few minutes. The forehead was contused and swollen from long-continued pressure against the pubis. The woman ultimately recovered, but her convalescence was retarded by neuralgic pains

in one hip and thigh. I attribute this complication to the needless prolongation of labour, which might have been safely terminated some hours earlier by the means adopted at the last.

CASE 15.—*Primiparous Labour at Thirty-eight years of age—
Arrest in the latter part of second stage from rigidity—
Result favourable to mother and child.*

This patient had been in labour for about thirty hours, when my assistance was requested by the gentleman in attendance, I found the head presenting in the first position, resting on the floor of the pelvis, where it had remained stationary for about four hours. The pains had been active until within the last hour or two, when they gradually declined in force and frequency. I applied the forceps, and by lever action, with little or no downward traction, extracted a fine living male child in a few minutes. The patient did well.

CASE 16.—*Multiparous Labour, attended by a midwife—Delay from slight disproportion—Forceps delivery, with safety to both mother and child.*

The patient, aged 30, the mother of six children, had been many hours in labour. The membranes had ruptured twelve hours before I saw her. I found the head presenting in the third position, and *just beginning to engage in the brim*. The os uteri was not yet fully dilated, the pains were vigorous, but caused no perceptible advance of the head. I applied the forceps at once, and delivered slowly, using tolerably strong traction at intervals. The head in its passage through the pelvis rotated into the occipito-anterior position by the natural mechanism, without any twisting or lateral direction being given to it by the forceps. The child was born alive, owing, I believe, to the head not having fully engaged in the brim, and, therefore, not being subjected to compression during the long interval of delay previous to the use of the forceps.

CASE 17.— *Multiparous Labour, attended by a midwife—Delay from slight disproportion—Forceps delivery, with safety to mother and child.*

This patient was 40 years of age, the mother of seven children, and had been seven hours in labour when I saw her. The pains had been vigorous for some hours, but latterly decreased in frequency and force. I found the head in the first position, arrested in the cavity of the pelvis. I delivered with the forceps with moderate exertion. The child, a male, was living. The moulding of the head indicated slight disproportion. Recovery favourable.

OBSERVATIONS ON FEVER IN LIVERPOOL.

By ROBERT GEE, M.D., M.R.C.P.,

PHYSICIAN TO THE LIVERPOOL WORKHOUSE AND FEVER HOSPITALS, AND LECTURER ON
DISEASES OF CHILDREN AT THE ROYAL INFIRMARY SCHOOL OF MEDICINE.

LIVERPOOL has acquired an unenviable reputation as a home for fever. We are now witnessing the decline of an epidemic which for severity has been unexampled since the "Irish fever" of 1847, and which for duration has greatly exceeded that memorable visitation. The foe takes its departure but slowly, as though unwilling to quit a spot where it has severed so many ties, and found scope for its pestilential and deadly action.

The town is never exempt from cases of typhus, so that it may be said to be endemic. In 1860, when the mortality from fever was unusually low, there must have occurred at least four thousand cases to account for that comparatively low death rate. From that period, fever, at first gradually, and then rapidly increased, until it reached its culminating point in 1865, when the deaths in the borough numbered 2,338, representing at the least 30,000 persons stricken with the disease.

The guardians of the public health were naturally alarmed, and perplexed to find that, notwithstanding all their efforts, a disease, generally acknowledged to be a preventable one, was numbering its victims in the proportion of 5 per 1,000 per annum of the whole population, and 13·9 per cent., or more than one-eighth part, of the whole number of deaths recorded within their jurisdiction.

How is this condition of things to be explained? To what must it be attributed? These questions have often been asked, but it is not easy to give a categorical, determinate answer. In order to arrive at an approximate explanation, it will be necessary to review briefly the conditions favourable to the dissemination

of fever, and to inquire whether they exist in such measure in Liverpool as to account for its unsatisfactory sanitary state. But, in the first place, it would be well to consider whether there is any defect as regards the situation of the town, or faulty management on the part of the municipal authorities, to account for it.

1. *Situation of the town.*—This, taken as a whole, may be said to be unexceptionable. It has for its substratum the red sandstone, has a westerly aspect, is built on the side of a hill, is open to the north, west, and south, and has a large tidal river at its base. It has thus secured to it the full benefit of the sun, with free scope for ventilation; it is in great part sheltered from the east; its site affords convenient falls for the removal of drainage, with the sea for its depository; a combination of elements of salubrity rarely equalled in any large town. There are districts known as the “low” parts of the town, but they are sufficiently elevated to admit of good drainage.

2. *Action of the Municipal authorities.*—It must be candidly admitted that the Town Council have not been neglectful of the public health. They have, on the contrary, been unwearied in their efforts to raise its standard. This will be obvious from the following summary of the works which have been carried into execution, or are in process of accomplishment, under their auspices, viz., the completion of a comprehensive scheme of sewerage, the introduction of a constant and plentiful supply of water, the erection of baths and washhouses, the formation of public parks and grounds for recreation, the opening up of ill-ventilated courts and the demolition of houses unfit for residence, the widening, repaving, and scavenging of streets, and the partial substitution of water closets for noisome, mephitic open middens. When it is stated, in addition, that these improvements have been, and are being, carried out under the advice and superintendence of medical officers and engineers of acknowledged repute, it will be at once seen that our municipal authorities have not been indifferent to the health of the town, but have availed themselves of the advantages presented by its situation, and introduced all recognised sanitary improvements. It is clear, therefore, that the fact of typhus being endemic here, is not owing to insalubrity

of situation, nor is it the result of defective sanitary arrangements. Individual nuisances crop up from time to time, it is true, but they are exceptions, and do not affect the broad features of the work which is being carried on with a view to the general improvement of the town.

I now pass on to the consideration of the *predisposing* causes of fever, and propose to inquire how far they exist, and what influence they exercise on the spread of fever in Liverpool. They may be classified under the heads of destitution, intemperance, over-crowding, bad drainage, and the foul, uncleanly habits of the lower orders. Unfortunately, the public have entertained the idea that these are the efficient causes of typhus; and as the profession have not pointed out the error, and explained that in which they differ, they are commonly supposed to be identical in action. It is very desirable that sounder views on this subject should be promulgated, for the attention of the authorities and the community is withdrawn, in a great measure, from what really propagates the disease, *i. e.*, a morbid poison disseminated by contagion, and concentrated upon those causes which are only predisposing. The sanitary measures, accordingly, bear reference chiefly to these, while subordinate importance is attached to the former, the principal factor of the fever-producing agencies.

1. *Destitution*.—There must necessarily be a large amount of poverty in this town, where so much unskilled labour is required, where there are so many immigrants in search of employment, where the cost of living is comparatively high, and where, owing to various circumstances, work is irregular and uncertain; as a rule, the diet of the labouring classes is defective in quality, and, when there is scarcity of work, it must also be deficient in quantity. That fitful and uncertain employment, with its attending circumstances, has not proved more baneful, must be ascribed to that conservative power of the system, by which it is able in a remarkable manner to accommodate itself to inadequate or insufficient food; nevertheless, destitution, by its depressing influence on the mind, and its gradual undermining action on the body, exercises a prejudicial influence, and acts as a powerful predisposing cause of fever.

But whether labour be abundant or scarce, whether food be dear or cheap, it must be admitted that there is at all times a large class in indigent circumstances, almost amounting to destitution, and consequently we have this predisposing cause of fever always amongst us. Nearly all the cases admitted into the Fever Hospital are from the labouring classes, and I found, on investigating the circumstances of a great number, that 31 per cent. represented themselves as being very poor—*i. e.*, poverty *per se*; that in 22 per cent. of the cases poverty was associated with overcrowding; in 2 per cent., with nuisances; in 7 per cent., with intemperance; and in a few cases the whole were combined, so that in 70 per cent. of the cases poverty might be registered as a predisposing cause.

The origin of the late epidemic has been ascribed to a large increase of destitution in the town in 1861. The evidence in favour of that opinion is not conclusive to my mind, for, if such existed, it was not so pronounced as to excite general attention at the time, and fever did not assume an epidemic character until the latter end of 1862.

2. *Intemperance.*—Habitual intemperance was not acknowledged to exist in many of the cases admitted into the Fever Hospital. This was probably owing in great part to the patients being chiefly labourers, and not of the artizan class. Intemperance *per se* was admitted to exist in 6 per cent. of the cases only; intemperance associated with poverty in 7 per cent.; with other predisposing causes in 8 per cent.; so that the whole number amounted to but 16 per cent. The proportion would have been greater had all the patients been adults; but as many were children and young persons, in whom the vicious habit of drinking to excess could hardly have been formed, it is not surprising that the average was so low, even when taking into consideration the enormous amount of drunkenness which prevails. There can be no doubt but that habitual intemperance not only renders the individual peculiarly obnoxious to the influence of contagion, but also materially lessens his chance of recovery when overtaken by fever.

3. *Over-crowding.*—This has been looked upon as the most

baneful and most prolific of the predisposing causes of fever, and it was with no small amount of interest that the numbers of those patients who avowed its existence in their families were summed up. It was found to prevail in 32 per cent. of the cases admitted into the Fever Hospital—viz., *per se*, in 2 per cent., in conjunction with poverty in 22 per cent., with other predisposing causes in 8 per cent. This would probably give but an approximate idea of the extent of the evil, and of its influence as a predisposing cause of fever; for what might be considered excessive over-crowding from a sanitary point of view, would not be so regarded by those, upon whose testimony we depended, who were practically unacquainted with a different kind of domiciliary arrangement. It would *a priori* have been expected chiefly to prevail amongst the occupiers of court houses, but it was quite the reverse. It was observed principally amongst the occupants of what are called “front houses,” and in the proportion of two to one. This would arise, no doubt, from greater facilities being presented by such houses for the sub-letting of rooms to different families, a practice very prevalent in the town. In addition to the overcrowding in the interior of the dwellings of the poor, there is another form prevailing, most pernicious in its effects, that of crowding too many houses on the surface of the districts they inhabit. The streets are narrow, and at short intervals are tapped by openings into narrow courts, so that every available yard of ground is built upon, and, consequently, the density of population in some parts cannot be exceeded in any town of the kingdom. With a few exceptions, the patients were admitted from those dense districts; they had, therefore, necessarily been subjected to the influence of a vitiated atmosphere.

4. *Nuisances*.—Under this head are included imperfections of sewerage, giving rise to unwholesome smells. The complaints on this score were very few, amounting in the whole to 8 per cent. In no case could it be referred to as a predisposing cause *per se*, in 2 per cent, bad smells in the house co-existed with poverty; in 5 per cent, the two were associated with over-crowding; and in 1 per cent with intemperance.

Some years ago, great and general satisfaction was expressed

at the diminished rate of mortality from diseases of the zymotic class. Upwards of two millions sterling had then been expended for sanitary purposes, exclusive of more than a million and a half for an improved water supply. The registrar general, in referring to this reduction in the Liverpool death rate, stated that the expenditure had "borne ample fruits," the typhus death rate having fallen at the time to a fraction under one and a half per thousand, per annum, of the inhabitants. That encomium may surely be reiterated at the present time; as it was found, during the late epidemic of fever, that only in conjunction with others, were morbid agencies, such as come under the control of the municipal authorities, known to exist as predisposing causes of the disease in the cases admitted into the Fever Hospital.

It has been the practice to measure sanitary work by the amount of zymotic disease prevailing. In other words, the predominance or otherwise of diseases of this class has been the gauge of the completeness or imperfection of such operations. Now, while fully appreciating their value in promoting and improving the social and physical condition of all classes, rich as well as poor, it must be confessed that, to set up such a standard, is to forget the existence, or to deny the power, of other predisposing causes. These latter were in the ascendancy during the late epidemic, which probably would not have been the case had sanitary work been neglected.

5. *Slovenly habits of the poor.*—It is to be deplored that the habits of the labouring classes should be of that character as to warrant their being ranked among the predisponent causes of disease. I have visited their dwellings in some of the lower districts of the town, and observed, in some houses, such an amount of disorder and uncleanness, such accretions of dirt and putrescent animal and vegetable matter, as would baffle description. The constitutions of the people inhabiting such dwellings, would be materially impaired and enfeebled, and they would therefore be peculiarly liable to be overtaken by fever.

While reviewing these various predisposing causes, and inquiring into their relative value as fever producing agencies, one cannot but notice the significant fact, that those causes, such

as emanations from sewers, &c., which are subject to the direct control of the municipal authorities, were of small gravity during the late epidemic, but that intemperance, overcrowding, and poverty, causes which are not easily dealt with, and cannot be so effectually suppressed, were in operation in 64 per cent. of the cases which were investigated. These unfavourable elements are always present in a large community like Liverpool, varying in degree from year to year, according to the abundance or scarcity of food and work; but, as far as I have observed, there has been no marked difference in the general and ordinary condition of the working classes for the last ten or fifteen years. If there has been any change, I think it is a change for the better in regard to employment, but poverty and intemperance are not materially lessened. There have been seasons of temporary distress in the spring of the year, when easterly winds have continued an unusual time; and there was a scarcity of employment in 1861, and the earlier part of 1862, owing to a diminution in the cotton import. It must, however, be borne in mind that there was no increase of fever during the said periods of temporary distress,—periods extending over a few weeks at a time; neither was there an increase worth recording during the season of 1861–62, when the cotton porters were but indifferently employed; but that it was after work had become more abundant, *i.e.*, towards the end of 1862, that fever notably increased.

If this be a correct representation of the state of the working classes, previous and subsequent to the late outbreak of fever,—of what may be called their normal condition,—it would be erroneous and unphilosophical to ascribe that epidemic to an intensification of any single predisposing cause, seeing that those which prevailed, and were well recognized, were adequate to account for it; unless that increase was so manifest as at once to convince all that there was a peculiar relation between that increase and the fever generated. If it be objected, however, that the above is not a correct description of the working classes, nor of the antecedents of those who were admitted into the fever hospital, I must have recourse to another source, for proof of its general accuracy. This is furnished by the reports of our medical officer of health. These

establish the fact, that a high rate of mortality (irrespective of fever) uniformly prevails in the town, undoubtedly the result of those influences, producing a low standard of health, which at other periods, and under different circumstances, would be predisposing causes of fever.

I would sum up my views of the rôle which predisposing causes play in an outbreak of fever in the words of Dr. Alison, quoted from his pamphlet on the "Epidemic of Fever in Scotland in 1848, and its connection with the destitute condition of the poor," merely inserting *predisposing causes* for the term *destitution*, which he used as relating to the subject he was then writing upon. "But, in accordance with the principles which I have stated above, and which are exactly the same as stated formerly, it will be at once perceived that the relation which I maintain to exist between predisposing causes and fever, is not simply that of cause and effect, but that of *predisposition*, favouring the effect of another cause, which is essentially variable. Where predisposing causes exist, they prepare victims for fever, but the fever '*bides its time*.' It springs from a specific contagion (at least that is the only source from which we are sure that it springs) which rises and falls in intensity from various causes, known and unknown; but when, in the course of these fluctuations, it invades a community where there is a large amount of misery and destitution (predisposing causes), its extension there is, *cæteris paribus*, much greater than elsewhere."

Having thus adverted to the predisposing causes, I shall now briefly refer to the exciting cause which has predominated during the late epidemic, viz., contagion. It would be out of place to enter upon the inquiry as to whether fever may be spontaneously generated; and, farther, it would be of no practical utility; for there is no evidence, or even suspicion, of such origin, during the late outbreak, and it is improbable that such a concurrence of circumstances, or such an aggravation of predisposing causes, has arisen, or will arise, here to originate the disease *de novo*. I shall therefore pass on to the consideration of the exciting cause, the communication of the specific poison from one labouring under the disease to a healthy person. This might occur, and frequently

does occur, without the interposition of the predisposing causes, as observed in the cases of individuals in the better ranks of life who have contracted the disease, and whose position would elevate them beyond the influence of such predisposing causes as destitution, overcrowding, and filth; but the usual mode, as proved by the inquiries which I instituted, is through the medium of the predisposing causes; at all events they were in operation in a large proportion of my cases. These prepare a soil in which the germ of fever readily fructifies; while they might not originate the specific poison, they might and would favour its development and dissemination.

Demonstration of the importance and influence of contagion, during the late epidemic, is found in the following report. In 68 per cent. of the cases admitted, there had been exposure to contagion through members of their families being affected. In 26 per cent., fever was known to prevail in the same courts, or in the adjoining houses in the street. Two per cent. were sent from lodging houses, where there was no evidence of contagion; and 4 per cent. were ignorant of having been in contact with fever cases. There is evidence then to prove that 68 per cent. of these cases had contracted the disease through direct intercourse with other members of the same household; and that 26 per cent. had lived in an infected neighbourhood.

To the profession, as being familiar with the contagiousness of typhus and with the social habits of the poor, the opinion that 94 per cent., at least, had taken fever by means of contagion, will not be deemed unfounded; and a suggestion that the remainder caught it in the same manner, though the source was unknown, might not be considered hyperbolic.

The opinion that the patients admitted from infected districts had been exposed to contagion, and that the morbid poison had thus been transferred from the sick to the healthy, is grounded on the following characteristics of the poor.

1. Their sympathy, or, possibly, their curiosity or dread of being deemed unneighbourly, which prompts them, regardless of consequences, to visit their sick neighbours, fever cases as well as others; a commendable practice, no doubt, if adopted with dis-

cretion, but fruitful of danger when indiscriminately exercised. The reverse is the custom of the better classes when fever is known to exist among their friends, and evil consequences are thus averted.

2. The practice amongst convalescents of visiting friends. In their weak state, they "take the air," are accosted in the streets, and call upon their acquaintances, while carrying about their persons the fomites of the disease.

3. The intercourse of children. This takes place most probably after convalescence is somewhat advanced. Children living in the same court, or occupying adjoining houses in the low districts of the town, would naturally be acquainted with each other; the healthy would associate with the sick during recovery, and thus be liable to contract the disease, or convey the morbid poison to members of their families more susceptible than themselves. I have been led to think that the fever is sometimes communicated to families by this mode, from having occasionally observed that a child has been the first to be attacked with fever, and that the disease has subsequently prostrated all the other members.

With fever always existing among us, and with its causes, predisposing and exciting, always in operation, the question naturally presents itself, How is it that fever is so variable in extent, at one time reduced to a minimum, at another so rife as to be called epidemic? When the conditions necessary to its extension and development are persistent and tolerably uniform, why is the disease not equally uniform in amount? This is a problem which cannot readily be solved, and yet some explanation should be attempted. The public are apt to search for an elucidation in drains and middens, in filth, over-crowding, poverty, and intemperance, the predisposing causes. We find, however, that these do not vary (it is very certain that sanitary nuisances are much less potent than formerly), and the exciting cause does not fluctuate in its efficiency and power. Some attribute the variation to a *pandemic* influence, which appears at intervals of time; but this is an undetermined point, and a very questionable theory.

I am disposed to think that the explanation is to be found

in the *subjects* of the disease, and not in the aggravation of the causes, or in a supposed but undemonstrated pandemic influence.

This opinion is based on the fact that in the course of a few years (after an epidemic wherein a large proportion of the impressible inhabitants would be affected, and consequently be proof against future attacks) a new generation of *susceptible* subjects springs up in the lower parts of the town, composed of infants and young children grown up to an age more obnoxious to the poison, of immigrants who had not previously been exposed to the influence of contagion, and of others who might have been either less susceptible or less exposed to the influence of the morbid poison during a previous epidemic, succumbing to it at a later one.

With regard to *age*, it is generally acknowledged that, while other zymotics are principally diseases of infancy and early childhood, typhus is observed chiefly among adults. The following table of the ages of the patients admitted into the Fever Hospital confirms that view.

Age.	Per cent. of Admissions.
Under 5	1
From 5 to 10 . . .	11
„ 10 to 20 . . .	36
„ 20 to 30 . . .	27
„ 30 to 40 . . .	15
„ 40 to 50 . . .	4
Above 50	6

It is, therefore, manifest that after a few years' respite the children would arrive at an age when they would be much more liable to the action of the typhus poison.

I have not ascertained the proportion of *immigrants*, but have no hesitation in assuming that a large majority of those admitted between the ages of fifteen and twenty-five were of that class; *a priori*, I would judge that such would be about the age they would have attained on arrival here; hence their susceptibility.

With reference to the third class, it is not unreasonable to suppose that many who at one time were not susceptible might,

through changes of circumstances and residence, and by prolonged exposure to the undermining and debilitating influence of the predisposing causes, become more likely at a future time to succumb to the exciting cause of the disease.

The above is not offered as a complete explanation of this *vexata questio*. The view I have taken is strongly corroborated by the ages and character of the patients which have come under my care; and these may be taken as a fair representation of what would be observed in any epidemic of fever. The table of ages differs slightly from the record of ages of the London fever hospital. The proportion under ten being smaller, and above forty being greater, in the London hospital; but this may in some measure be accounted for by the fact, that some of the cases admitted there are paid for as private patients.

The principle of *susceptibility of the subject* will explain not only the prevalence of fever at certain cycles or periods of time, but of other infectious diseases, such as morbilli and scarlatina, included in the class of zymotics. These prevail at all times to a certain extent; but, with a periodicity which may almost be calculated, they increase so as to become epidemic. It is true that their orbit is more circumscribed, and their epidemic appearance therefore more frequent, but this is owing to their partial limitation to the young; whereas typhus is not so restricted in its course, because it is chiefly observed among those who are in the prime of life. While the former are essentially diseases of childhood, the latter is a disease of adolescence.

Whether this explanation of our late epidemic be satisfactory and conclusive or not, it seems to me at all events to be in accordance with the fact, that the sanitary condition of the town is not deteriorated, with the circumstances of the subjects who become a prey to the disease, and with its occasional, if not periodical, augmentation and extension.

It would be well if the measures to prevent or mitigate epidemic typhus could be as readily applied, as the causes of its dissemination are ascertained. In my previous remarks I have referred to the value of the predisposing and exciting causes, and to the condition of the subjects, as exercising their several

parts in the spread of the disease. It is true that the two latter may and often do act independently of the former, but as a rule their influence is brought to bear upon those who have been subjected to the sway of these predisposing causes.

The *subject* is innately susceptible of the poison of typhus, and as yet no means have been discovered, as vaccination in variola, by which that susceptibility can be eliminated. Some of the predisposing causes have been energetically and successfully contended with by the municipal authorities, but there are others, unfortunately too rife, which are ineradicable by sanitary legislation. I allude to the social vices, and household dissoluteness, which have attained to such magnitude as to defy any power as yet brought to bear upon them. Some good might be accomplished in this direction, by appointing men of prudence and energy as inspectors over small and manageable districts; men interested in their vocation, who by their conduct would secure the respect of the poor and improvident, and whose encouragement of the one, and remonstrance with the other, might be attended with favourable results. With regard to contagion, the exciting cause of typhus, I must state my belief that more might be accomplished than has hitherto been effected, in checking its prolific agency. The predisposing causes would be almost, if not entirely powerless, and the inherent liability of the inhabitants would be of no avail, if this, the leaven, were not in operation; and it appears to me that the extinction of this is the only feasible method by which the plague can be arrested.

To effect this desirable object, a more complete system of isolation and disinfection should be organised than has ever been attempted; and this might be secured by energetic and harmonious co-operation on the part of the municipal and parochial authorities. It would involve much labour and considerable expense at the outset; but, apart from the momentous interests which are at stake, the end would *financially* justify the means.

OBSERVATIONS ON LITHOTOMY,
(BEING THE SUBSTANCE OF TWO CLINICAL LECTURES DELIVERED AT
THE ROYAL INFIRMARY,)

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SCHOOL OF MEDICINE.

GENTLEMEN,

You have lately witnessed a case which proved fatal two days after lithotomy; and the circumstances attending the operation, and observed on post-mortem examination, were so peculiar, that I deem it prudent on this occasion to depart from our ordinary course of clinical instruction, which consists simply in demonstrating disease as commonly observed, and speculate on some of the casualties occasionally met with in the course of an extensive experience. The successful and brilliant results attending our operations for stone are the most pleasant, and to junior students the most instructive, for contemplation; but the surgeon very generally finds he derives instruction more useful to himself and his future patients, by careful study and observation of the circumstances attending his unsuccessful cases. By this means alone can he hope to escape the dangers and risk of operative practice, and learn how to overcome them when unavoidably encountered. It is a duty we owe to the public, and those who place their lives in our hands, that every case, and specially those that terminate untowardly, should receive our full and critical examination. Might the result have been otherwise? Might not the patient have recovered, or life at least been prolonged, had such and such been done, or this and that left undone? It is a painful investigation, but it is one that the conscientious surgeon must hold with himself very often.

M. K., aged 37, a sickly, pale, anæmic-looking man, was admitted in April, 1867, suffering from all the usual symptoms of stone, in an aggravated form. He had complained, more or less, for upwards of three years, but during the last ten months his general health had failed, and he had been completely incapacitated from work. At the time of his admission he was unable to retain his water for more than five minutes, either night or day. It was of very pale colour, specific gravity 1007, mixed with pus, neutral, and containing particles of flaky matter. On microscopic examination, no tube casts could be found, but a small quantity of albumen was frequently detected on the application of heat and nitric acid. On examination with the sound, which however caused such pain that chloroform was required, the bladder was found much contracted and its walls unusually rigid and rough. Sometimes the presence of a small stone was readily detected, but at others, although every care was taken, it was impossible to be sure of its presence, and this was the more remarkable, inasmuch as *during* the examination it was occasionally struck, and then again could not be found. The examinations were repeated upon several occasions, at intervals of four or five days, and each time were followed by an exacerbation of suffering and an increased quantity of unhealthy matter in the urine. By the use of warm baths, rest in bed and the mineral acids with pareira, the urine somewhat improved in appearance, but it continued persistently of low specific gravity and always contained flaky matter. After a while, he was able to retain it for about three quarters of an hour. No evidence could be detected of prostatic enlargement, but the gland felt thickened and unusually fixed and rigid when examined by the rectum. The question of operation under these circumstances was carefully considered. Lithotripsy was evidently inadmissible, and the prospects of recovery after lithotomy appeared more than doubtful. The character of the urine and the man's cachectic and cadaverous appearance rendered it probable that the kidneys were not in a healthy condition; but, at the same time, as albumen was not constantly present in the urine, and as it appeared possible that the symptoms might arise from the diseased condition of the

bladder alone, the removal of the calculus afforded the only prospect of relief.

On the 28th of May, the operation was performed. After the patient had been placed upon the operating table, a careful search for the stone with the sound was made, and again, as before, it was occasionally felt. Sufficient evidence was obtained to justify the operation, but the position of the calculus could not be accurately ascertained. The curved staff being introduced, the ordinary incision was made and the prostate divided, so as to admit the end of the finger into the bladder. And now the difficulties of the operation began. I was unable to feel the stone with the finger, or with the forceps, which were used in the ordinary way, and appeared to pass fairly over the whole surface of the contracted bladder. Repeated careful search was made, but with no other result. I felt convinced that the point of my finger was fairly past the prostate, and in the cavity of the bladder, yet all my endeavours to find the stone failed. Having used every effort which I thought justifiable, I requested my colleague, Mr. Hakes, to examine the bladder, and he, as you observed, succeeded, after prolonged endeavours, in reaching the stone, which was found in another cavity above and behind that in which I had been exploring. Being small, it was then readily removed, but not until the parts had been subjected to constant manipulation for at least twenty-five minutes. The patient was removed to bed in an exhausted condition, and never rallied fairly from the effects of the operation. Vomiting commenced the same afternoon; pain over the lower part of the abdomen was constant, and the patient gradually sank, and died on the third day.

You may readily conceive how anxious I was to obtain an examination of the body, in order to ascertain the cause of the great difficulties which had presented themselves, and which doubtless led to the speedy fatal termination of the case, but the consent of the friends could not be obtained, and, consequently, I was obliged to content myself with simply removing the pelvic viscera and one kidney by enlarging the perineal wound. The condition of the bladder was very peculiar; its walls greatly thickened, and the mucous coat thrown into numerous deep rugæ, and everywhere ulcerated. Its cavity appeared to be divided into two distinct

compartments, by an enormously hypertrophied muscular band, which passed across its floor, between the orifices of the ureters. The upper cavity, or bladder proper, capable perhaps of containing a bantam egg, was formed by the hypertrophied textures before mentioned; the lower one was bounded by broken down and ulcerated tissues, the result of disorganisation of the posterior part of the prostate gland; and the further part of this cavity was separated from the general cavity of the abdomen, by little more than the peritoneum. This membrane showed evidences of injury, for traces of recent inflammatory action were observed on its internal surface. Numerous small abscesses existed in the remaining portion of the prostate, and its texture generally was very friable. The left kidney was pale and flabby, but, on section, did not present any characteristic appearance of fatty or amyloid degeneration. The ureters were enlarged and thickened.

FIG. 1.



BLADDER AND PROSTATE SEEN FROM BEFORE.

- a, Upper cavity.
- b, Muscular ridge between the ureters.
- c, Lower cavity.

From the drawings and the description of the condition of the bladder, you will see the difficulty in reaching the stone is readily explained. When the sound was introduced by the urethra, it passed directly into the lower cavity behind the prostate, where no stone could be found, but by keeping the instrument well against the upper wall of the urethra, its short, sharp curve permitted it to mount over the muscular bar on the floor of the bladder and enter the upper cavity, where the stone was found. But with the staff this was impossible; its large curve incapacitated it from passing over the bar into the upper contracted cavity, rigidly fixed and drawn up, as it was, behind the symphysis. Thus, the finger, guided by the staff, entered the lower pouch, and I failed to reach the part where the stone rested.

FIG. 2.



VERTICAL SECTION OF BLADDER AND PROSTATE,
Showing the two cavities, the muscular ridge and the position of the stone.

If the precise condition of the parts had been known beforehand, of course the difficulty would have been overcome much more readily than it eventually was, and the disturbance and injury consequent upon the prolonged manipulations, which

doubtless increased the hazard of the operation, would have been proportionately less. The lesson, then, which we may draw from the case is this;—to examine the patient with the utmost care before operating, and, if possible, be satisfied regarding the condition of the parts and the position of the stone. But, you may say, the previous examinations were repeatedly and carefully made in this case, and an opinion, not altogether incorrect, expressed regarding the state of the bladder. I was not aware, however, at the time, that such a condition as we met with ever existed, but if you read the excellent observations on lithotomy by Charles Bell, you will find he mentions this abnormal formation of the bladder, and describes it as due to an hypertrophy of the muscles of the ureters, consequent upon their long-continued irritation. He gives also a drawing not unlike that I have shown you, and which represents very accurately the parts in this case. Here, however, we had this additional complication, that the walls of the lower cavity were thinned and disorganised from disintegration of the posterior part of the prostate.

There is not much danger in simply opening the bladder by the ordinary incisions of lithotomy. The risk of the operation is from the subsequent disturbance and injury to the parts in searching for and extracting the calculus. I am so well satisfied of this that I have on some occasions operated when I have not been by any means thoroughly convinced that a calculus existed, and where, all other means failing, I have thought that the rest afforded to the bladder by an incision through its neck, permitting the constant escape of the urine without any muscular contraction on its part, might act beneficially. Let me mention a case.

J. E., aged 45, suffering from all the usual symptoms of calculus, but in whom I could not detect a stone, was under my care for many months about ten years ago. His urine was constantly purulent, and often contained blood. He was unable to retain it for more than half an hour either night or day. All the ordinary methods of treatment failing to do good, and the man becoming emaciated and exhausted from constant suffering, I proposed this operation, to which he readily con-

sented. I did not find any stone, but the bladder was greatly thickened and contracted. I introduced a lithotomy tube, and retained it in the incision for a week, and afterwards, by passing it through the incision every second or third day for some weeks, I prevented the wound from closing. Immediate relief to his distressing symptoms ensued, and, to my great delight, as the fistulous opening at length gradually contracted, the urine passed by the urethra without pain, and two months after the operation he was able to retain his water for two hours, and sometimes longer. The patient thought himself cured, and I lost sight of him till a few months ago, when I learnt that for several years he had experienced little or no trouble with his bladder. Curiously enough, a few months ago a stricture of the urethra formed behind the bulb, and many of his old symptoms returned. The stricture has fortunately yielded to the regular use of the bougie, and now again the patient is restored to comfort. I performed a similar operation on an elderly man not long afterwards, and found the neck of the bladder occupied by a fungous mass, which was evidently of a cancerous nature. No permanent benefit resulted, but the patient was immediately relieved from his previous distress, and continued for a long time in comparative ease.

We occasionally meet with cases of soft calculi, where it is impossible to elicit the characteristic signs with the sound, such as we are taught alone justify lithotomy, and yet where, if this operation were undertaken, relief might be afforded. Many years ago I attended such a case, in consultation with Dr. Barrett. The operation was not performed, and after death, which occurred some months subsequently, we found a soft gelatiniform and fibrinous mass, the size of a walnut, in the bladder. It was so soft that it yielded readily to pressure, and upon allowing it to dry it shrivelled so as not to be larger than a filbert. On making a section, it appeared to consist of inspissated mucus containing grains of calculous matter. The bladder in this case was much thickened and diseased, but there was no sufficient disease of the other organs to account for death. Three or four years ago a boy was admitted

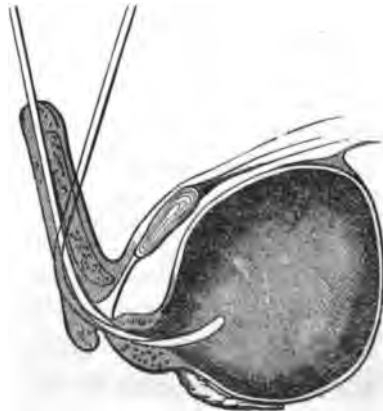
into the Infirmary, under the care of Mr. Long. He had an enormous prolapse of the rectum, which was in a state of absolute gangrene. From the history of the case, it appeared that he had had difficulty in passing water and the ordinary symptoms of calculus for many months before. Examination with the sound, however, failed to give any evidence of a stone. In a few days the child died, and upon *post-mortem* examination a stone was found in the bladder, as large as a damson and as soft as putty, so that the impress of the finger remained upon it when pressed. On cutting through this soft substance, which was about half an inch in thickness, a small urate of ammonia calculus was found in the interior. Some years ago another very similar case occurred in my own practice. It was that of a boy who had every symptom of a stone, but in whom repeated examinations gave no clear indication of its presence. When the sound was introduced I could feel, with my finger in the rectum, some apparent thickening in the posterior part of the bladder. I operated, and extracted a mass precisely similar to that just mentioned, and the child recovered. The occasional occurrence of such cases goes far to show that the bladder may sometimes be justifiably and beneficially opened, even when the existence of a calculus is by no means certain. But in saying this I beg you will understand that I do not advocate recourse to such an operation unless every other means of affording the patient relief has failed.

The operation of lithotomy has always been one of peculiar interest to the surgeon, and, without doubt, much of this interest has been fostered by the varying circumstances attending its performance and its results; circumstances which, though sometimes shrewdly guessed at, can seldom be foretold with accuracy. Thus, you have often seen the operation completed within a minute, everything being apparently most simple; while occasionally, as in the case which has suggested these remarks, though by the uninitiated nothing unusual has been anticipated, great difficulties have arisen, and fully twenty minutes or more have been spent before the stone could be removed. Lithotomy, if quickly and correctly performed, is usually successful, and in

proportion to the time occupied the difficulties and the dangers of the operation increase. It is desirable, then, to operate quickly; yet there is no operation in which it is so necessary to proceed cautiously, remembering always that the parts necessarily injured in opening the bladder, and during the extraction, will bear only a very limited amount of irritation, and that any unnecessary disturbance of these textures will give rise to inflammation, which, in nine cases out of ten, ends only in death. "Make haste—slowly" should be constantly in your mind. Let me explain myself more fully; and first you will understand that I am describing the lateral operation, as practised by Cheselden, and, with few exceptions, always adopted in this hospital.

After the patient has been placed in the proper position, and the curved staff introduced fairly into the bladder, it should be confided to a trustworthy assistant. He should hold it steadily and firmly, neither hooked up under the pubic bone or pushed down upon the rectum. The handle of the staff should be held exactly in the median line, almost vertically, but inclined downwards (or towards the feet of the patient), about an inch from the exact vertical position. This is a point of material importance, for otherwise the point of the staff might not, in the adult subject, fairly enter the bladder. My meaning will be at once understood by a glance at this diagram, Fig. 3.

FIG. 3.



TO SHOW ANGLE AT WHICH STAFF SHOULD BE HELD.
The shaded staff, being wrongly held, is seen not to enter the bladder properly.

It is not desirable to have too much urine in the bladder at the time of operating. An ounce or two is enough, and will facilitate the future stages of the operation. More would probably embarrass, by increasing the area in which you have subsequently to search for and secure the stone. Moreover, the sudden collapse of a distended bladder, at the moment it is opened by the knife, would very likely cause it to fall in folds upon the calculus, and prevent its ready detection. If the patient, then, can retain the urine for an hour or an hour and a half before the operation, it is enough. The bowels, of course, have been cleared by a dose of oil on the previous day, and the rectum washed out by a simple enema an hour or two before the operation.

So much regarding the preliminary steps, and they are of no small importance. Now I will mention the chief points to be attended to in the subsequent stages of the operation, which, for convenience of description, may be divided into three periods—*i. e.*,

1st, Opening the bladder.

2nd, Seizing the stone.

3rd, Extracting it.

1st. The cutting part of the operation ought not to present any difficulty, to one who has the ordinary use of his hands and a correct knowledge of the anatomical disposition of the parts. These parts are not liable to any variations that need influence the surgeon when lateral lithotomy is determined on. The artery of the bulb may be given off at a higher or lower point than usual, or may not arise at all from the internal pudic. When arising low it is not a matter of material importance, for although this renders the artery more liable to injury, I have never known any serious difficulty in securing the vessel when cut, if only there is a sufficiently free external incision; but the latter occurrence is more serious, because the hæmorrhage which then results is altogether beyond the surgeon's control. The artery then arises from the internal iliac, and, coursing along the side of the prostate gland, is terribly exposed to incision when the bladder is opened. Fortunately this variety of distribution is very rare. I have met with it but once. The patient was a Spaniard, whom I cut for stone in Erskine-street Hospital. Plugging the wound deeply round a gum-elastic tube arrested external bleeding, but

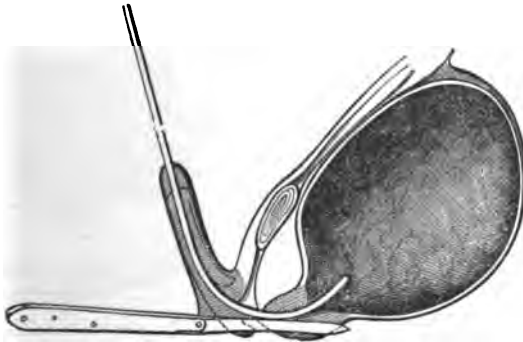
it bled on into the cellular tissue of the pelvis, and after death, which occurred on the fifteenth day from cellulitis and peritonitis, I found large clots in the position I have mentioned, and the arteries arising on both sides from the internal iliacs. The prostate gland is sometimes enlarged, but never forms any impediment in this part of the operation.

The chief points to attend to are to have the patient well placed on a high table, with the buttocks slightly raised, exactly of equal height, and square to the table. Of whatever length you make your external incision, and it should seldom be less than three inches in the adult, let one-third of it only be in front of the anus. The knife should be held firmly but lightly, the forefinger resting on the back of the blade, the end of the handle steadied and supported against the centre of the palm, and no change from this position need be made till it is finally laid aside. The first incision, if well planned, should at once divide all the resisting textures, and admit the forefinger of the operator's left hand into the cellular space behind the triangular ligament. Here he will feel the staff, running nearly parallel with his finger, and just above it. The finger nail is then to be pressed gently into the groove of the staff at the furthest point at which it can be reached—i. e., just in front of the prostate. The point of the knife, supported by the finger nail, and protected by the groove of the staff, is then made to open the urethra and enter the groove; the blade is turned nearly sideways, and pushed steadily onwards along the groove, till it is felt to have entered the bladder. Then the knife may be removed, and the finger, which has rested in the wound at the point where the urethra was opened during this deep incision, is passed along the groove into the bladder. A careful estimate should now be made regarding the size of the incision you have made through the prostate and neck of the bladder. If the finger feels embraced at any part, as if surrounded by an elastic and unyielding india-rubber band, you may feel sure you have not incised the whole length of the prostatic urethra. Probably the elastic ring surrounding the neck of the bladder has not been cut. Manipulation with the forceps would then be dangerous.

It would lead to the mucous lining of this vitally susceptible part being extensively detached and lacerated, and fatal inflammation and sloughing would almost certainly follow. The remedy is simple. Retaining the finger grasped as it is by the prostate or neck of the bladder, you must slide up flatways upon it past the contraction a narrow, straight, probe-pointed bistoury, and then by simply turning its cutting edge towards the part that should have been cut, the contraction is felt to give way, and the part yields readily to gentle pressure with the finger, and may be dilated to the necessary extent without danger.

There is a mistake which the inexperienced surgeon is extremely apt to commit while making the deep incision, and as I have known it occur on some occasions, and be followed by the most disastrous results, I cannot too strongly warn you of it. It occurs most frequently in the cases of children, in whom the bladder is more an abdominal than a pelvic viscus, and is consequently situated much higher than in the adult subject. I committed the error I allude to myself in my first lithotomy, and therefore have the less scruple in speaking of it.

FIG. 4.



TO ILLUSTRATE THE DANGER OF NOT DEPRESSING THE HANDLE OF THE KNIFE IN CHILDREN.

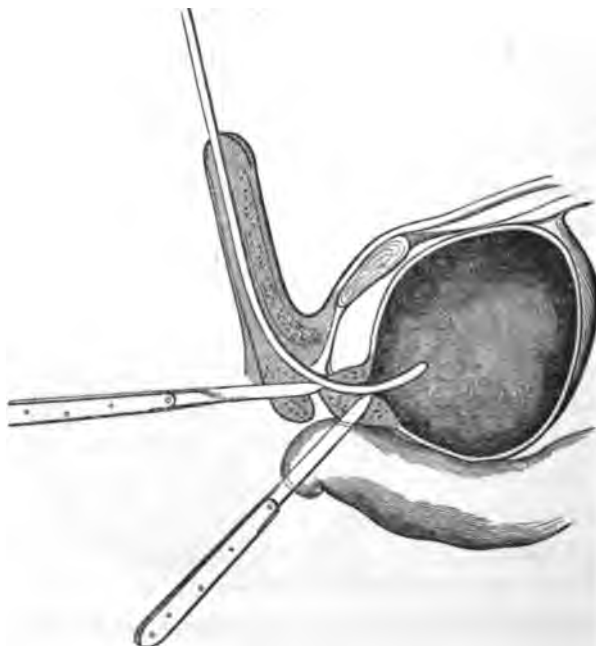
Point of knife having left groove in staff is seen passing behind the prostate.

After the urethra has been opened, and the point of the knife lodged in the staff, the surgeon is apt to fancy he is perfectly safe in pushing it onwards, as long as he feels the blade is fairly in contact with the groove. He forgets that he is cutting on a convex surface, and that unless he depresses the handle of the

knife as he pushes it on, the point soon leaves the urethra and cuts into the cellular tissue behind the prostate, failing altogether to open the bladder. Here the operator works away with his finger, and soon succeeds in making a space which he fancies is the bladder. Of course, he cannot find the calculus, and if unfortunately his staff has been withdrawn, he probably never gets into the bladder at all. I could tell you of some very remarkable mistakes I have seen arising in this way, but it is enough that I have warned you how to avoid the error.

Depress the handle of the knife more and more as you push it on, till at the termination of the incision, it is nearly against the lower end of the external incision. A moment's

FIG. 5.



TO ILLUSTRATE THE DEPRESSION OF THE HANDLE OF THE KNIFE WHILE MAKING THE SECTION OF THE PROSTATE.

reflection will inform you that the left lobe of the prostate is divided more or less, according to the degree you have depressed the handle of your knife in making this, the deep incision. Much has been written on this subject, some operators

advocating its free division, others limiting it as much as possible, from a morbid apprehension that division of the fibrous capsule enveloping the prostate would certainly lead to fatal extravasation of urine into the cellular tissue of the pelvis. But it is evident this capsule must be opened under any circumstances at the apex of the gland, if the prostate is cut at all; and the increased risk arising from a slightly extended incision is not to be compared with the danger of laceration, which is otherwise almost certain to occur during the extraction of even a medium sized calculus. If you take care never to allow the point of your knife to leave the groove in the staff while pushing it on, or while withdrawing it, you need not fear making too free an incision, though the handle of the knife has been depressed to the degree I have described.

Thus far, the operation offers no real difficulty to the practised surgeon, but the next stage, *i. e.*, that of seizing the stone, is sometimes a matter of considerable trouble, even to one well used to the operation. The varying and the various positions that the stone may occupy, the possibility of its becoming displaced at the moment the finger, or still more so the forceps, enter the bladder, the different size, shape, and consistence of calculi,—all matters open to more or less conjecture, and materially influencing the readiness with which the stone may be seized,—render this stage of the operation one of anxiety. And when we think how much the embarrassment increases if the stone is not at once caught, and how much the safety of the operation is compromised by the repeated introduction of the forceps, and the consequent injury to the neck of the bladder, it behoves us to study well every means by which we can facilitate the object in view. A very eminent and successful surgeon, whose opinion I asked regarding the prognosis of a case I had just operated on, replied, "It is sure to do well;" adding, "I never knew a case to do otherwise, if the stone was caught and extracted by a single introduction of the forceps." Doubtless the experience of others could point to exceptions to this rule, but there can be no question regarding the general correctness of the observation.

The natural position of a calculus is on the floor of the bladder, very near its neck, and here we may generally rely on finding it.

This is the only position in which it can be readily seized, and the surgeon should rarely be satisfied unless he finds it in this situation, by careful sounding just before operating. My experience leads me to believe, that it is often pushed away from the neck of the bladder by the surgeon or his assistants sounding the patient with the staff, to obtain the desired information. This requires the greatest care in manipulation, in order to avoid the risk of displacing the calculus. Sometimes, after the staff has been put into its proper position, it happens to rest upon or against the stone. This may be regarded as satisfactory, when it occurs unsought for, but no attempt should be made to *obtain* this position, for the reasons just given. Let the situation of the stone be carefully ascertained with the proper sound, after the patient is finally placed in position, and then certainly avoid all movements of the body, or interference with the staff as likely to disturb it. And now, how best to seize the stone? The bladder has been opened; the staff is still held as originally fixed; the finger of the operator is pressed on in the hope of reaching the stone, and ascertaining its size, shape, and position. If this can be done, its seizure is comparatively easy; the staff is then withdrawn, any unfavourable position of the calculus rectified by the finger, and forceps adapted to its size selected. Up to this point, the neck of the bladder has been effectually plugged by the finger, and hardly any urine has escaped. If the patient is a child, and the stone small, the finger may rest upon it while narrow bladed forceps are introduced along the under surface of the finger, and made to grasp the stone, fixed as it is, by the finger. But if the stone is large, or even of average size, larger forceps are required to extract it, and these, it would be unsafe to introduce, or at any rate unsafe to manipulate within the bladder while the finger remained. Consequently the finger must be withdrawn at the moment the forceps enter. The forceps should be introduced with the handle well depressed, and the flat surface of the blades parallel to the direction of the deep incision, *i. e.*, obliquely. As soon as they have entered the bladder, the blades should be turned to one side, away from the point at which the stone has been previously felt, then pushed on till fairly within the bladder, and, being opened widely, a three-fold movement is now to

be made; the lower blade of the forceps, hitherto lying obliquely, is turned flat, the handles are raised, and they are brought to the direct line of the outlet of the pelvis. By this manipulation, the lower blade is made to sweep the floor of the bladder, and the stone can hardly fail to be secured by then closing the blades. But if this manœuvre should fail, or if it has been impossible to touch the stone with the finger before introducing the forceps, another plan must be adopted. The exact position of the calculus must be ascertained, by using the closed blades of the forceps as a sound, and carefully searching every part of the bladder till it is found. Then by turning the blades aside, opening them, and repeating the movement before described, the stone will probably be grasped. Every movement with the forceps should be made with the greatest gentleness and precision, and the operator should constantly bear in mind that the prostate gland is a fixed body; that the great danger of the operation is from unduly lacerating and disturbing its capsule of attachment, and that the only method of manipulating the forceps within the bladder with safety, is by making the prostate the axis of every movement.

Regarding the third stage of the operation, or the extraction of the stone, it is unnecessary that I should say much in this place. Now-a-days, patients rarely allow a calculus to gain any considerable size before submitting to the operation, and consequently the extraction is often simple enough. But if there is any resistance to its ready passage, I cannot impress upon you too strongly the importance of great gentleness. Gentle, steady traction, with occasional slight lateral movements, the handles of the forceps being always well depressed, will enable you to extract a stone with much greater ease and safety, than by violent efforts, injudiciously directed. There is great danger in this stage of the operation of detaching the mucous membrane from the neck of the bladder, and consequently every care should be taken. If the soft parts do not yield readily, it is better to confide the forceps to an assistant, while you divide any resisting fibres round the calculus, with a narrow-bladed probe-pointed bistoury, than to run the risk of injuring these important structures by tearing them.

There are some points in the treatment after lithotomy to which we pay special attention, and these I may briefly allude to here. First:—the use of the gum-elastic tube, which we always employ, and from which we often derive great advantage. It establishes a regular passage along which the urine flows as secreted, and, by preventing the immediate adhesion of the sides of the wound, lessens the danger of urinary infiltration. You need not suppose that the urine passes exclusively through the interior of the tube. After the first few hours, most of it flows by its side, but still it does good by preventing primary union. In some few cases in which I have not used the tube, I have found it necessary to introduce the finger to re-open the wound, owing to the patient suffering from retention of urine, the consequence of the urethra being obstructed by inflammatory swelling, or by clots of blood. The tube may be removed in twenty-four hours after the operation in the case of children, or in forty-eight in adult patients. In the next place, attention to cleanliness is of the greatest importance after this, as after every other operation; and much advantage will be experienced by raising the head of the bed, so that the patient rests on an inclined plane, and the urine is prevented from wetting the upper parts of the body. By this contrivance, together with a sponge frequently changed, which should be wrung out of some antiseptic fluid, and placed against the perineum, the patient may be kept perfectly dry. Thirdly:—regarding the use of local applications, or of medicines. The less done the better, except under special circumstances. If there is much pain about the wound, lasting for more than a few hours after the operation, an opium suppository affords the best means of giving relief; but I am sure it is better to avoid its administration, unless the suffering is considerable and protracted. Where really required, opium is invaluable, but otherwise it is apt to derange the digestive system; and after all operations our first object should be to maintain the patient's digestive powers in as perfect a condition as possible. Sometimes patients complain of considerable pain over the lower part of the abdomen, and then hot fomentations over the part are most soothing and useful.

**TABLE OF OPERATIONS PERFORMED AT THE
LIVERPOOL NORTHERN HOSPITAL.**

WITH REMARKS BY

JOHN BRADLEY, *House-Surgeon.*

THE cases enumerated in the following table were operated on at this Hospital, during a period extending over rather more than twelve months, viz., from June 6th, 1866, to July 25th, 1867. Most of the injuries came from the docks situated in the immediate neighbourhood of the Hospital, which furnish a constant supply of almost every variety of fracture and injury. In many instances, amputation had to be undertaken under unfavourable circumstances, especially in the case of thigh injuries, where, as the following table shows, the mortality was unusually great. A few notes have been added of the more interesting cases.

Operations.	Recoveries.	Deaths.	Total.
<i>Amputation</i>			
of thigh	1	5	6
at knee-joint	0	1	1
of leg	5	2	7
of foot (Syme's)	2	0	2
do. (Chopart's)	1	0	1
at shoulder-joint	3	2	5
through upper arm	2	1	3
through fore arm	5	0	5
<i>Excision</i>			
of knee-joint	1	1	2
of elbow-joint	1	1	2
<i>Lithotomy</i>	4	1	5
<i>Herniotomy</i>	1	2	3
Total	26	16	42

Amputation of the Thigh.

This operation has been performed on six occasions, once only with a successful result. The cases terminated fatally as follows. One an hour after the operation from the shock. In this case, the patient, aged 42, was suffering from a compound fracture of the fore arm, and an extensive scalp wound. The popliteal artery was torn through, the compound fracture of the leg for which the operation was performed being high up. One from the same cause, thirty-six hours after the operation. The patient was 50 years of age. One in five days, from exhaustion and irritative fever. One in seven days, from intense local inflammation passing on to mortification. And one in twelve days, from pyæmia. The operation with antero-posterior flaps, by transfixing the limb, is the one generally adopted.

Amputation at the Knee-joint.

This operation was performed once, for compound fracture, and terminated fatally. The patient had led a most intemperate life, and in every respect was an unfavourable subject for any operation. The stump became gangrenous, and the patient died on the sixth day.

Amputation of the Leg.

This operation was performed for injury in seven instances, with two fatal results. A woman, 68 years of age, died from shock a few hours after the operation. In the other fatal case pyæmia was the cause of death, on the twenty-second day.

Amputation of the Foot.

Two cases of Syme's and one of Chopart's. These terminated favourably.

Amputation at the Shoulder-joint.

Five cases—two of them are fully related in another part of this volume by Mr. Lowndes. Of the five cases that were operated on, two terminated fatally; one in forty-eight hours from shock, and the other in eleven days, from secondary hemorrhage and pyæmia.

Amputation through the Upper Arm.

Three cases—one fatal. In the case that terminated fatally, the injury had been caused by a crush beneath some railway waggons, by which the structures on the side and back of the chest had been much bruised. These sloughed extensively, and death was caused by exhaustion on the tenth day.

Amputation through the Fore Arm.

Five cases—all recovered.

Excision of the Knee Joint.

CASE 1.—A man, aged 55, admitted under Mr. Hakes (till lately surgeon to the Hospital), with old standing disease of the knee-joint. The case appeared favourable for excision, which was performed by the semilunar incision. On the sixth day, the patient had several rigors, and died on the seventeenth day with well-marked symptoms of pyæmia.

CASE 2.—A young woman, aged 22, for disease of the knee-joint of five years' standing. On admission, there was very considerable swelling of the joint, but she most complained of fixed and excruciating pain. Mr. Manifold excised the joint on April 25th by the semilunar incision. The case has gone on well. A few sinuses from time to time required opening up, and a portion of carious femur was removed by the gouge. Though the patient has not at present left the hospital, the bones are firmly ankylosed, and her general health is very much improved. The persistence of some discharge from a sinus prevents her at present making use of the limb.

Excision of Elbow-joint.

CASE 1.—The patient, aged 26, had been run over by an engine, and, in addition to other serious injuries, was suffering from a compound fracture of the elbow-joint, and for which excision was performed by Mr. Lowndes. In consequence of the other injuries above alluded to, it was afterwards necessary to amputate the left foot, immediately below the knee, ten days

after he had been in the hospital. He died twenty-four days after the excision of the joint from well-marked symptoms of pyæmia.

CASE 2.—A boy, aged 16, was admitted on January 10, 1867, under Mr. Lowndes, with acute inflammation of the elbow-joint, from an injury received ten days before admission, which, in spite of treatment, resulted in disorganisation of the joint. Excision was performed on March 28th, by the H incision. The patient did well, and left the hospital with a useful limb.

Lithotomy.

CASE 1.—A boy, aged 4 years. A small mulberry calculus was removed by Mr. Lowndes by the lateral method. The case made a good recovery.

CASE 2.—A boy, aged 12. Mr. Lowndes performed the lateral operation, and removed a mulberry calculus. Recovery.

CASE 3.—A boy, aged 11, admitted under Mr. Harrison. The patient had suffered from symptoms of stone for several years. Four lithic acid calculi, weighing together nearly two ounces, were removed by the lateral method. The mucous membrane of the bladder was very rough, and felt impregnated with calculous deposit. The patient made a good recovery.

CASE 4.—A boy, aged 14 years, admitted under Mr. Lowndes, with symptoms of stone extending over eight or ten years. The lateral operation was performed, and a very large stone was found lodged in, and almost completely blocking up, the neck of the bladder. With much trouble this was removed, and, on examining it, it was at once evident that a portion had been broken off. This was found on introducing the finger again into the bladder, and was readily removed by the forceps. The two portions had been attached by means of a narrow neck. The patient made a good recovery.

CASE 5.—A man, aged 29, was admitted under Mr. Lowndes, suffering from some chronic disease of the bladder. Though he had many of the symptoms of stone, yet none could be detected after the most careful examination. Notwithstanding treatment of every kind, the patient's symptoms increased in severity—

great irritability and pain in passing urine were the most prominent. The bladder was opened by the lateral operation that is adopted in cases of stone. By this means the urine obtained a free escape, and the patient experienced great relief. He, however, gradually became weaker, and died from exhaustion on May 30, nearly two months after the operation. At the *post-mortem* examination, both kidneys were found full of tuberculous matter, and the bladder most remarkably atrophied. For convenience of arrangement, this case has been placed under the heading "Lithotomy."

Operations for Hernia.

CASE 1.—A man, aged 50, was operated on by Mr. Lowndes for strangulated inguinal hernia. The sac was opened. Death occurred in two days from acute peritonitis.

CASE 2.—A man, aged 24, was admitted under the care of Mr. Lowndes, for strangulated inguinal hernia. The sac was opened. On the following day acute peritonitis and pleurisy set in, and he died thirty-six hours after the operation.

CASE 3.—A man, aged 30, was admitted, under Mr. Harrison's care, with strangulated inguinal hernia. The operation was performed about ten hours after symptoms of strangulation set in. The sac was opened. The patient made a good recovery.

ON THE MECHANICAL TREATMENT OF SOME FORMS OF DENTAL IRREGULARITY.

By JOSEPH SNAPE, L.D.S., R.C.S.,

DENTAL SURGEON TO THE ROYAL INFIRMARY, AND LECTURER ON DENTAL SURGERY AT THE
SCHOOL OF MEDICINE.

If an irregular position of the teeth be owing to the malformation of either one, or both jaws, little can be done to overcome the deformity with any prospect of success. All such attempts have hitherto proved failures, although every conceivable plan has been tried. Tedious inconvenience, of months' duration, has been borne, in some cases with such exemplary patience, that were it possible, success must have been achieved. This being known, there is little difficulty in deciding whether a case of dental irregularity is, or is not, capable of rectification.

If the deformity be occasioned through the jaws being too small, although otherwise proportionate, the extraction of one or more teeth will often soon reduce the remainder to such a symmetrical condition in the maxillary arch, that their numerical deficiency will seldom be detected, even by a professional eye, without an especial examination.

Our present object is not to treat generally upon dental irregularity, but to show how effectually the simplest contrivances will act upon some forms which require mechanical treatment; thus doing away with the risk of producing as much mischief as that we are trying to remedy, by engendering caries of those teeth the position of which we are endeavouring to change.

For all practical purposes, caries of the teeth may be said to be occasioned by a chemical decomposition of the enamel, which is caused by an acid of some kind or other, which proceeds from either the eructations of a disordered stomach, the secretions of an inflamed mucous membrane, from a vitiated state of the

saliva, or from a more detrimental source than all these combined, viz., the acid formed by the decaying food left upon and between the teeth. Many parents are unaware of the danger arising from this latter cause, and the patients are generally too young and inexperienced to understand, or appreciate, any advice that may be given. As it is evident any mechanical appliance used in cases of irregularity, let the construction be what it may, must necessarily cause an extra accumulation of this alimentary deposit, it becomes the duty of the practitioner to avert these dangers, by having his mechanism as simple, and as free from ligatures as possible, and every facility should be afforded for removing the plates for the purposes of cleanliness.

This plan has been adopted in the treatment of the following cases, with the most gratifying results. We must not omit to mention that, although working as if the whole responsibility rested with us, we endeavoured to impress the minds of both parents and patients, with the paramount importance of preserving the teeth in a healthy condition, by constant cleansing. The following dentrifice was prescribed to cleanse the teeth, and neutralise any acidity.

Magnes : Carbon : Pond.

Sodæ : Bicarbon. ãã 3ij.

Creta Precip :

Pulv. Iridis. Flor : ãã 3ss.

Ott : Rosæ gtt. iij.

M.

CASE 1.—Is one of the most common forms of dental irregularity. Under this type we sometimes find one, often two, and not unfrequently all four of the upper incisors, upon closing the mouth, shut within those of the under jaw, instead of over them. This abnormal position of one or more of these teeth, when once established, is permanently maintained by mechanical action, as, upon closing the mouth, the pressure of the posterior of the lower incisors upon the anterior surfaces of the upper, must inevitably overcome any natural tendency there might exist, to assume a correct position. Such cases as these are not occasioned by any defect in the size of the jaws, but by the irregular eruption through

the gum of the permanent incisors, the time being normal in one jaw, and abnormal in the other.

In the case before us (Fig. 1.) the incisors of the lower jaw appeared before those of the upper, and took their places a little anterior to those of the temporary, which soon fell out, and as the new teeth increased in length, they advanced, and occupied the places of their predecessors. Whilst this progress was taking place in the lower jaw, the incisors of the upper were at a comparative standstill, so that when they did make their appearance, it was behind those of the temporary, which were not loose, but retained their places. The incisors of the lower jaw, having progressed so far in advance, closed between the temporary and permanent of the upper jaw, thus forcing the latter still further back. Other causes may also operate to produce such deformity, but all are of a strictly mechanical nature, and the treatment adopted to remedy such defects must also be mechanical. In this case constant pressure was exerted upon the irregular teeth, in such a direction, that not only were they prevented from falling into their abnormal position when the mouth closed, but were forced into the direct line of the arch. This may be effected in various ways, and almost all who have written upon the subject give different directions; some, if followed, may be very effectual in reducing the deformity, but, as we have before said, very disastrous in injuring the teeth. In treating the present case, the two temporary teeth were removed, and a cap of gold was made to cover all the lower ones, and adapted to fit with the greatest accuracy. On the superior margin of this plate was soldered a bar, or shield, of the same metal, in the form of an inclined plane, so that the irregular teeth, instead of falling into their unnatural places when closing the mouth, their lingual surfaces fell upon the anterior surface of the inclined plane, and by this means were soon brought into the position represented in Fig. 2, which is drawn from a cast taken when the mouth was fully formed. As no ligatures were required, the plate was easily removed, and as easily cleansed. With a very little tact, the plan of using the inclined plane may be so modified, as to meet almost every case like this.

FIG. 1

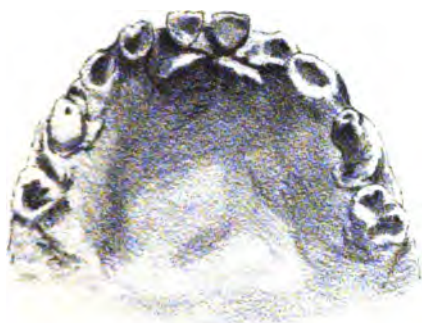


FIG. 2



FIG. 3

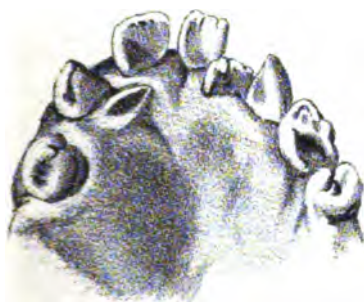


FIG. 4

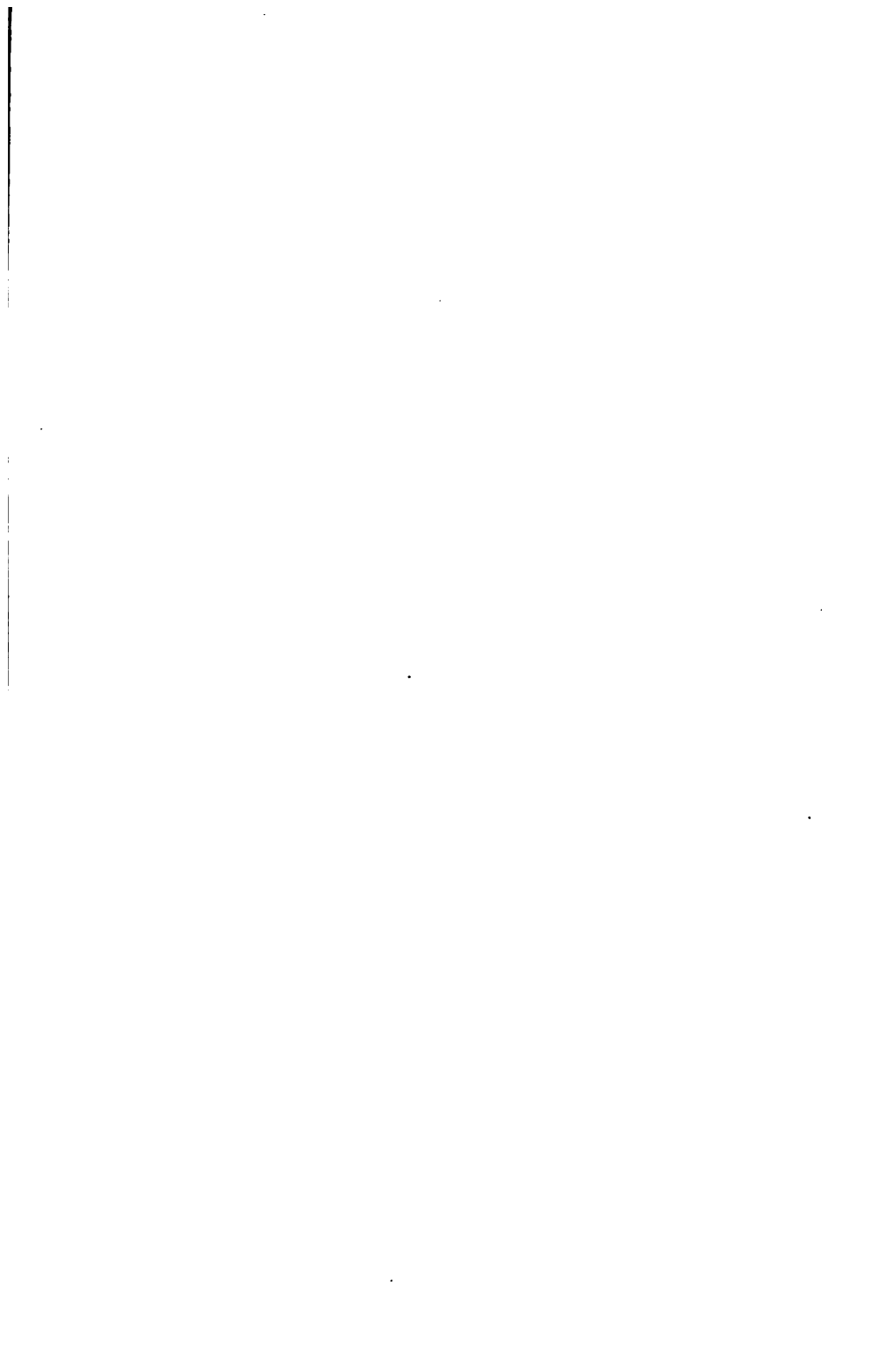


FIG. 5



FIG. 6





CASE 2. Fig. 3 is taken from a cast of the mouth of a young gentleman who was brought to me when between eight and nine years of age. It will be observed here that the lateral incisors are the teeth out of position. They not only close abnormally within, instead of without, the lower incisors, as in the former case, but occupy places posterior to those of the centrals. The following treatment was adopted:—The upper temporary canines were removed, and the lower teeth capped with a plate, as in the former case, armed with a shield, which now, instead of a single, had a double incline, or, in other words, simulated in form the section of a cone. In closing the mouth they were subjected to a double action, and at the same time were moved both in an anterior and lateral direction. In the course of a few months the teeth were brought into the position represented by Fig. 4, from a cast of the mouth taken at the time. It will be understood that during treatment the shield had to be frequently altered in accordance with the changes that were made. When the permanent canines appeared, they presented themselves above the lateral and anterior bicuspid on each side of the mouth. As there was not room for them to arrange themselves symmetrically, the anterior bicuspid on each side was removed. When I last saw my patient, it would not have been suspected that irregularity of any description had ever existed. No injury was sustained by the use of the plates, and the loss of the bicuspid was beneficial in preventing the others from being too crowded.

CASE 3. Fig. 5 gives an entirely opposite form of irregularity, which is often very difficult to manage. The patient in this case, a young lady, was brought to me when about the age of nine. The left central incisor projected very much, and overlapped the adjoining tooth; the remainder of the teeth were crowded. The advice given to the parents, much to their disappointment, was to wait until the temporary teeth were all changed, and the mouth more fully formed. Not feeling quite satisfied with this, they consulted another practitioner, and he, more sanguine than myself, commenced the treatment by the action of a spring upon the irregular tooth. Its use was continued for several months,

plate (Fig. 10) was adapted to fit all over the lingual, and partially over the coronal, surfaces of the lower teeth. A portion of the plate opposite the four incisors, requiring to be moved, was cut away (Fig. 10, A), and attached to two arms or bearers (B B), the ends of which were tapped so as to form screws, and a nut (C C) attached to each. On either side of the plate was placed a socket (D D), in which these arms rested, so that the pressure upon the irregular teeth could be gradually increased by turning the nuts. In less than three months the reduction was complete, and the mouth assumed the more normal appearance represented by Fig. 11. Plates adapted to the altered state of the mouth were worn until the teeth were firm.

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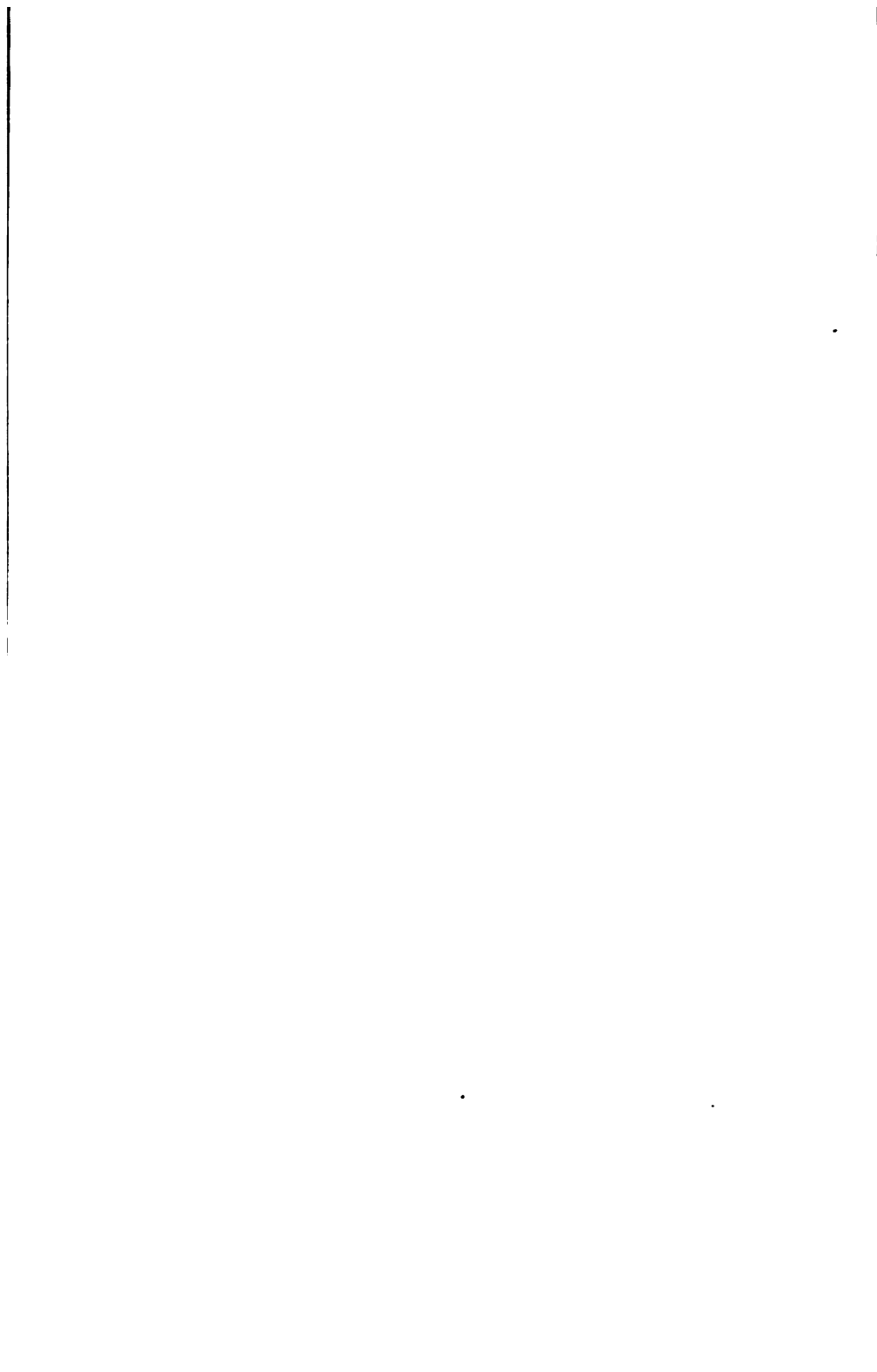
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PREFACE.

IN presenting the Second Volume, we avail ourselves of the opportunity that is afforded us of expressing our gratification at the very great success which has attended the publication of the First Volume of these Reports. We could on that occasion only hopefully speculate on a future; but now, with a past so encouraging, we shall be further stimulated to make our Annual Volume what we wish it to be, viz., a storehouse for gathering in and elaborating the scientific material that everywhere abounds in our densely populated town and neighbourhood.

THE EDITORS.

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LIVERPOOL

MEDICAL AND SURGICAL REPORTS.

ON ULCER OF THE STOMACH,

By THOMAS INMAN, M.D. LOND.,

PHYSICIAN TO THE ROYAL INFIRMARY.

AMONGST the women who present themselves for admission into the wards of our Infirmary, a large proportion suffer from ulcer of the stomach. Amongst the male applicants very few indeed have this affection. Judging roughly, the proportions are ten of the first to one of the last. The individuals are for the most part young, their ages varying from about twenty to thirty-five. In appearance they are often healthy; and the doctor sees with surprise that good-looking women can be suffering sufficiently to seek for a bed within the walls of a hospital. Yet though the real affection which underlies all their other complaints exists in the stomach, this organ is rarely referred to, and the patients seem to be wholly unconscious of there being anything amiss with it. Sometimes the prominent symptom is jaundice, sometimes debility, and sometimes excessive palpitation. By far the most common, however, is myalgia; there is, for example, excessive pain in the neck, between the shoulders, in the left or on the right side, in the abdomen, in the loins, or round the flanks, and sometimes in the buttocks and the lower extremities.

Now the existence of myalgia leads to the conclusion that the sufferer therefrom must be overworked, or underfed, or be constitutionally delicate. If, then, the labour which a patient has

undergone is not greater than usual, if she was accustomed to go through it for a long period without pain, and if her family history is good, it is clear that there is some temporary cause in operation, which produces weakness in the muscular tissues. By a few questions being answered in the negative, the physician ascertains that the seat of the disorder lies in the stomach, and that the patient eats very little in consequence of the pain produced thereby.

In some of the rarer forms of the affection the prominent symptom is chlorosis; and I have sometimes been led to doubt the reality of this last named disorder as an independent disease. The most prominent case which I have met with, illustrative of this doubt, occurred about twenty-two years ago, in the practice of a distinguished physician of this town. The patient, a young woman, for whom the same gentleman had successfully prescribed before, applied for admission into the Infirmary, and was admitted as a typical case of chlorosis. There was not a single symptom which is considered as pathognomonic of the disease in question which was absent; nor was there anything whatever which directed the attention of her medical advisers to the stomach or to the liver. The complaint seemed to be purely a blood disease. After being under observation for a few days, the patient died suddenly, and great interest was felt in the *post mortem* examination; deaths from chlorosis being very rare. On looking upon the intestines *in situ*, something unusual was seen in the part where the liver adjoins the stomach, and after a careful investigation it was found that there was a large ulcer in the latter organ. This was evidently an old one, and was what the surgeons would call callous. It had a superficial area of about five inches, and its depth from the surface of the stomach was about the third of an inch—in its progress it had caused adhesive inflammation between the stomach and liver, and had eaten its way entirely through the gastric tissues and into the hepatic structure—the bottom of the ulcer being formed by the substance of the liver. The other parts of the body were healthy, but pale.

This case is remarkable in every way. It demonstrates that an ulcer in a very small portion of the mucous membrane of the

stomach may, as it were, so influence the rest as to make it useless for the production of healthy chyme — or in some unknown manner to interfere with the general nutrition. Yet with this affection there was no emaciation of the body; the food taken had evidently been digested. The case still farther tells us that the integrity of the liver may be seriously impaired, and yet no jaundice, or other symptom of hepatic lesion, be observed.

The particular symptom last mentioned has its interest increased by the following case, which came under my own care. I admitted a young woman into the Infirmary, as a case of jaundice; and being unable to find any assignable cause therefor, I merely treated her with aromatic spirit of ammonia. After a while the patient left of her own accord, nearly well. Very shortly afterwards, however, she returned, almost in a dying state from gastric bleeding. The amount of blood passed by vomiting, and from the lower bowel, was enormous; and the woman lay for some days on the brink of the grave. By the judicious management, however, of the junior house-surgeon, Dr. Rawdon, and the unremitting care of the nurse, she survived; was treated as for ulcer of the stomach, and went out perfectly cured. In this instance it is probable—though it cannot be demonstrated—that the jaundice was indicative of the state of things which eventuated in the ulcer.

Of the cause of the disease of which we speak I have nothing new to say. Pathologically the complaint consists of the presence of one or more ulcers in the mucous membrane, of sizes varying from that of three fingers to a pin's head. On one occasion I saw at a Pathological Society a stomach taken from a man who had died from gastric hemorrhage, and all the members examined it closely to discover the source of the bleeding, without success; the ulcer was so minute that it escaped attention. Yet, by the merest accident, I found it the next day, when in the act of stretching the organ on the tip of my finger, preparatory to making a section for the microscope. The ulcer, which did not admit a probe, was examined with a bristle, and was found to have eaten its way into the coronary artery, and thus produced death. In some instances a stomach is found to contain ulcers in an active condition, and the cicatrices of others; some shew the scars alone; thus demon-

strating that the disease may be entirely cured. As a general rule there appears no tendency to a spontaneous restoration to the normal state without appropriate management.

Whenever an ulcer exists in the stomach there is a constant danger to life. The danger arises from an extension of the disease in depth—the perforation of the peritoneal coat before the membrane has been glued to the bowel or other organ. When the stomach thus gives way, its contents escaping produce general peritonitis, and death usually within a few hours. In these cases the suddenness and severity of the symptoms give rise to the idea of poison having been taken. A thorough understanding of the nature of this perforation is essential to a full comprehension of the principle upon which our treatment is to be conducted.

When the stomach is sound it produces gastric juice of normal quality. This is secreted in quantity to effect digestion, and in quality according to the nature of the food. That which is formed to dissolve meat is stronger than that secreted to digest milk. The gastric juice is not formed when the stomach is empty. When once formed to digest meat, meat is dissolved. Now the stomach itself is meat, and not the less so because uncooked. Experience has told us that the organ in question is sometimes itself digested, *i. e.* if death has been sudden, and just after a full meal of animal food. The reason why the stomach does not always so act upon itself is, that its membrane constantly interposes a dense layer of mucus between the digesting mass and itself, and is thus protected. But when a portion of this mucous membrane has, by disease, been removed, there can be no protection formed to intervene between the gastric juice and the base and sides of the ulcer; consequently, at every meal which the victim takes, the process of self-digestion begins in the unfortunate stomach. As in the web of Penelope no real progress appears, for the activity of reparation is counterbalanced by the activity of the daily process of destruction. This process the physician may readily recognise with an intelligent mental eye. But he can make no physical observations, and is obliged to content himself with reading the symptoms. Yet ere we record these, let us notice that the ulcer may give way by being stretched beyond a certain point; the same cause will prevent its

healing; just as a puncture in a limb largely distended by dropsy will often refuse to close up. The ulcer may also give way in consequence of external pressure or injury transmitted through the abdominal walls.

The symptoms of the disease in question are readily recognised. They may be summed up thus:—there is habitual indigestion, a pain increased by all food, and persisting during the whole time the stomach is full. This pain is severe in direct proportion to the food taken; meat, and such fluids as wine and spirits, aggravate it to its highest pitch. There is also much suffering when the stomach is distended by flatus. Habitual painful dyspepsia, aggravated by a meat diet, is almost pathognomonic of ulcer of the stomach. Such accidents as water-brash, jaundice, hæmatemesis, melæna, vomiting, and gastralgia occasionally happen, but they form an unimportant item in the diagnosis.

We are now in a position to consider the treatment; and that I may explain myself clearly, I will refer my readers in the first place to the mouth and to the womb. Let him recall to himself the time when he had a fissure in the lips. He will then remember that any thing which made him open his mouth was so productive of pain that he was glad to keep his lips closed; the distension of them prevented the repose necessary to the healing process.

Again, he finds a patient flooding after delivery. His mental vision sees the huge surface from which the placenta has come, bleeding at every pore, and he knows that he must, if possible, diminish the area of that teeming wound. To effect this he endeavours to make the womb contract, for he knows that the superficies of the bleeding part will be reduced most effectually by diminishing the whole uterine surface. This may be seen, in reality, by first making a hole in a piece of strongly stretched india-rubber, and then allowing the caoutchouc to contract. It will then be noticed that what seemed an area as large as a shilling becomes less than the size of a groat.

Hence we deduce that the first treatment for ulcer in the stomach is to keep the organ as small as possible. The quantity

of food given at any one time must be very limited, *i.e.*, about three ounces should be the maximum.

Again, we must reduce the power of the gastric juice to dissolve the stomach to a minimum; and this can only be effected by a total abstinence from all solid animal diet.

Practically we carry these indications out by restricting our patients to a teacupful of bread and milk every three hours.

But the reader will at once recognise the fact that this amount of nourishment scarcely suffices to prevent debility—that this result must happen we foresee, and it is guarded against by diminishing the necessity for food to a minimum—all exercise and exertion are forbidden, and the patient is confined to bed. This is the routine practice followed in my wards, and I see no reason to alter it. After many years of close observation, I am convinced that all medicines, including alcoholic stimulants, are prejudicial; white bismuth is the sole exception; but the cases in which it has seemed to do good do not amount to one in twenty. All aperients do harm, and mercurials are especially baneful—I have never once ordered them, but my patients have taken them in spite of me, and invariably with a bad result. If the bowels require relief, “*enemata*” are the proper remedies.

Now I have always held that an intelligent Physician ought to be able to form a tolerably definite notion of the course of the case under his management; and this is certainly advisable when he prescribes a diet almost too small to support life, and wholly inadequate to support its active duties. To attain to precision, he must ask himself how long he expects that an ulcer elsewhere, under the most favourable circumstances, will require ere it is wholly and soundly healed. His mind then reverts to the period when he attended “hospital practice,” or he became otherwise acquainted with ulcers of the leg; and from various other sources he concludes that six weeks is an ample time for complete cicatrization, four of which are passed in the process of granulation and the formation of new skin, and two in the development of the cuticular structure. Consequently, he tells his patients who have ulcer of the stomach, that a strict, a very strict, attention to his

regulations is necessary, for at least a month, after which they will be modified. When such specific statements are made, the plan referred to above is generally followed, cheerfully, by the sufferer, whose courage is sustained by the knowledge that her trials have an end. During the first week, little change can be noticed; even myalgia, when severe, requires a longer rest ere it begins to abate its pains. After the first fortnight, the improvement in the general symptoms is very apparent, and the patient's spirits rise to such an extent as to make the confinement of bed irksome. In all such cases, I judge it to be the best plan to explain, in easy terms, the reasons for my proceeding, and have never yet found the sufferer recusant. We count the days together, like boys whose holidays approach; and when the month expires, the diet is enlarged by the yolk of an egg, egg-pudding, or bread and butter, &c.—just about one good mouthful; then, if all goes well to-day, to-morrow sees the supply doubled, and an hour out of bed is added as a reward; then, and hitherto without an exception, the eatables are gradually increased, until the patient takes the ordinary Infirmary diet, and can sit up, walk about, and otherwise act as any other woman.

I have now seen so much of this complaint at our hospital that I am almost enamoured of it, yet in private practice there are few diseases which the doctor is called upon to treat that I dislike to meet with more. Long experience has convinced me of the paramount importance of every detail of the plan which we follow out at the Infirmary, and these details can rarely be carried out in ordinary life. Ere now I have felt savage at a woman, who, week after week, has determined to take a slice of beef or mutton at the end of seven days, and who has thus undone in a few minutes the work of many hours. Another patient has taken a blue pill for "biliousness;" another has wearied herself with exercise; another has indulged in wine; another, with porter, because "she felt so very weak." Few can or will stay in bed. Yet each one expects "the doctor" to repair the mischief which they have done. Well, perhaps after all we must not grumble at this, for it is headstrong patients such as these which I describe that help to make the fortune of the physician. What is one

man's poison is another man's meat; and if people will persist in keeping themselves ill, when their advisers are doing their best to make them well, it is but justice that the former shall pay the due penalty, both in purse and person.

ON THE USE OF
THE BROMIDE OF POTASSIUM IN THE TREATMENT
OF SOME NERVOUS AFFECTIONS,*

WITH CASES.

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THERAPEUTICAL inquiry is a branch of practical medicine which has long been comparatively neglected; but it is now attracting increasing and well-merited attention. I have elsewhere made the observation that scientific medical inquirers had given less of their attention to the action and uses of medicines than to some other subjects, such as pathology, which, however indispensable as a basis for further research, often discloses to us the results of disease without throwing any light on the all-important question of treatment. I was glad to observe that Sir Thomas Watson, in his address at the opening of the Clinical Society, pointed out forcibly the great practical importance of this subject, and commended therapeutical inquiry to the study of the members of this new Society. We have other evidence of the increasing attention paid to this subject in the Gulstonian Lectures at the College of Physicians having been given this year by Dr. Harley, on the physiological actions and therapeutical uses of certain drugs in common use, in the formation of a therapeutical committee of the Harveian Society, and in the publication of a new monthly journal of therapeutics. I would, however, point more particularly to the recent researches by Dr. A. Crum Brown and Dr. Thos. R. Fraser,

* Paper read to the Liverpool Medical Society.

on the connection between chemical constitution and physiological action, as affording evidence, not only of increasing interest, but also as furnishing new facts of a definite and important character, deduced from experimental inquiry, aided by organic chemistry. They have proved that, by altering the constitution of several of the vegetable alkaloids, so that they are changed from nitrile to ammonium bases, their actions are so completely changed that we might say they are reversed. The subject is one which formerly engaged my attention; and, in a paper entitled "Researches on the Physiological and Medicinal Properties of some of the compounds of the Organic Radicles, Methyl, Ethyl and Amyl," I made the following observations on the probable difference in the effects of the alkaloids, according as they belonged to one or other of the series of bases. "We have no knowledge whatever of any relation that may exist between their chemical constitution and the different actions they exert on the animal economy. It is very probable, however, that an examination of the properties of the artificial alkaloids would throw light on this subject; for the progress of organic chemistry has shown that many of them have a definite composition and relation to each other, and they have accordingly been arranged in four series, viz., the amide, the imide, the nitrile and the ammonium bases. It would be interesting to know what are the properties of each of the artificial alkaloids (and I may remark that Dr. Simpson* has found that one of them, furfurine, has antiperiodic properties like quinine); but it would be still more interesting to know if certain properties are common to all the members of a series, and in what respect the bases belonging to one series differ from those of another. In this way we might expect to trace a relation between the composition and the effects of remedial agents, as well as to acquire new and valuable remedies."

The experimental researches of Dr. A. Crum Brown and Dr. Thos. R. Fraser have now actually proved what was here anticipated in 1854, and have demonstrated that certain properties are common to members of a series; for, by converting strychnia,

* Now Sir James.

brucia, thebaia, codeia, morphia, and nicotia, which are nitrile bases, into ammonium bases, by the addition of iodide of methyl, they not only reduced the poisonous properties of these alkaloids, rendering them comparatively innocuous, but they entirely changed their action on the nervous system; so that, whereas several of the nitrile bases, more particularly strychnia, cause violent spasmodic muscular contraction, the ammonium bases,—for example, the iodide of methyl strychnium,—paralyse the spinal motor nerves, and cause muscular relaxation. “We may conclude,” they observe, “from these facts, that, when a nitrile base possesses a strychnia-like action, the salts of the corresponding ammonium bases have an action identical with that of curare.”

This is not only a most important discovery, but it shows what great results in the elucidation of the *modus operandi* of medicinal agents may be expected from well directed inquiries, aided by the light which the present advanced state of organic chemistry can throw on the subject.

With these preliminary remarks, I proceed to give some illustrations of the therapeutical use of the bromide of potassium, which is now a remedy of acknowledged value in many nervous disorders. Bromide of potassium was first recommended as a remedy for enlargement of the spleen, by Dr. Thomas Williams; but it is somewhat strange that its sedative action on the nervous system was not found out till a comparatively recent period. Dr. Garrod tells us that the bromide of potassium was introduced into the Pharmacopœia of 1835, but that it was removed in 1851, no clinical evidence having been afforded in the interim of its possessing any powers which entitled it to be placed in the *Materia Medica*. It was afterwards, however, re-introduced; and in the last British Pharmacopœia we have likewise bromide of ammonium, which was brought into notice by Dr. Gibb, and is now used by many medical men as a remedy in hooping cough.

The most important of the effects produced by bromide of potassium are the following. 1. The alterative or absorbent action it sometimes exerts, which has been adverted to as the first discovered of its medicinal properties. 2. Its power of diminishing

sensation, and causing dryness of the throat and neighbouring parts, an effect which Dr. Gibb found to be more decidedly induced by bromide of ammonium, and led him to try it as a remedy in whooping cough. This power, which may be partly due to the local action of the bromides, but is no doubt chiefly owing to the sedative effect produced on the nervous centres through absorption, has likewise been turned to account in the treatment of spasmodic asthma. 3. In large doses, bromide of potassium produces sleepiness; and this is one of its effects to which I would more particularly direct attention, as it furnishes a valuable means for the treatment of some nervous affections. 4. It has a sedative influence on the sexual organs. 5. It has been found a valuable remedy in epilepsy. 6. In medium doses, continued for long periods, it produces the remarkable sedative effects which have been described by Dr. Bazire, the translator of Trousseau's Lectures, and of which an exceedingly well marked case has come under my observation.

The therapeutical use of the bromide of potassium, which I wish more particularly to notice, is the power which it has of producing sleep when administered in full doses. There is no medical man in extensive practice who has not in various cases experienced much difficulty in overcoming the troublesome symptom of sleeplessness, and felt the want of an efficient remedy in cases where opium could not be used. Though opium is one of the most valuable remedies in the *Materia Medica*, we all know from experience that it often causes increased restlessness instead of sleep, and produces various consequences, such as constipation, headache, &c., which render it altogether inadmissible with some patients. Though morphia is less liable to produce such unpleasant consequences, it is not free from these objections; and the various other derivatives from opium which have from time to time been brought into notice, such as the sedative solution of opium, chlorodyne, nepenthe, &c., are none of them entirely free from the objectionable effects of the parent drug.

When sleep is prevented by pain, arising from some abnormal physical condition of the body, opium in some of its various forms is the grand remedy; and, if we except chloroform, it has no rival

as a sleep-inducing agent in this class of cases; but there are others where the want of sleep arises from mental rather than from physical pain, or from trifling causes exciting a morbidly sensitive nervous system. In the latter, opium often prevents, instead of inducing sleep, and causes its after effects in an aggravated degree. I have tested the bromide of potassium in some cases of the latter description, and being convinced that it is a remedy of power, and one the value of which is scarcely yet generally known by medical men, I shall briefly give some details of a few cases of this description in which I have used it with advantage.

Brown Sequard was, I believe, the first to point out the value of the bromide of potassium in inducing sleep, and to show the mode of giving it, and the kind of cases in which it is most likely to prove of service. In one of his lectures on the recent advances of our knowledge in the diagnosis and treatment of functional nervous affections, he says, "It is of the utmost importance to improve the sleep, which is generally bad in persons attacked with a morbid increase of the reflex excitability. For this purpose an invaluable remedy has recently been discovered; it is the bromide of potassium. Excepting when pain is one of the causes preventing sleep (in which case opium, aconite, and belladonna should be employed together), I have found that this remedy has a wonderful power to produce quiet and refreshing sleep, without any drawback that I am aware of. I usually give to adults a dose of thirty grains of that salt a quarter of an hour before the last meal, and a second dose of from thirty to fifty at bedtime. In cases in which, without any nervous complaint, there is sleeplessness, owing to some cause of cerebral excitement, as well as in all neuroses, excepting hydrophobia, tetanus, very severe cases of delirium tremens, and some forms of insanity, sleep is almost always induced by that remedy."

Dr. Behrend has published in the *Lancet* some cases in which he gave the remedy with great advantage. It was, however, from reading Brown Sequard's lecture that I was first induced to make trial of it, and I shall now refer to some of the cases in which I have given it.

CASE 1.—In the early part of 1866, I had under my care a gentleman, about 67 years of age, of peculiar nervous temperament, but a man of great ability, who had occupied various important positions. I had often before attended him on account of dyspeptic disorders and nervous depression. Many years before, I had attended him when he had great irritation of the bladder, caused by an excessive quantity of the cubic crystals of oxalate of lime, on account of which he also consulted Dr. Prout. From this, however, he completely recovered, under treatment, first by Vichy water, and afterwards nitro-muriatic acid; and at the time referred to there were no oxalate of lime crystals in the urine. There were domestic circumstances disquieting him, and also the commercial panic, which somewhat affected him; and he had his usual dyspeptic symptoms—uneasy sensations in the stomach, bowels, and rectum, with flatulence, and also great nervous depression and sleeplessness. At this time, however, the symptoms were manageable, and I gave him the bromide with good effect, and left off attendance, as he got much better. In the month of April he had a return of nervous depression, brought on by the unexpected death of one of his most intimate friends; and he was for a time under the care of a neighbouring medical man, with whom I was soon after associated in the treatment of the case. He gradually got much worse, becoming so emaciated that suspicion of organic disease of the stomach or bowels was entertained, though there was no tumour or other positive evidence, but he had latterly the intermittent delirium which we not unfrequently observe in cases of malignant disease of the stomach; and the depression, uneasy painful sensations in the abdomen, and want of sleep were most difficult to overcome. In the latter stage, the bromide having failed to relieve, a combination of codeia and morphia in full doses was found most beneficial. I have referred to this case, as it was one that rendered it necessary to exercise all one's ingenuity to find available means to procure sleep, and, in the advanced stage, to relieve the painful sensations; and also because it showed me that the bromide had a power which might be turned to good account in less severe cases.

There was no *post mortem* examination, so that there was no positive evidence of the suspected cancer.

CASE 2.—I frequently attend a gentleman, about 68 years of age, of nervous temperament, who has for many years had slight facial paralysis, and who had about ten years ago, and subsequent to the facial attack, a very severe nervous attack, with some head symptoms. He suffers habitually from constipation, and at times from dyspepsia, with flatulent painful sensations at the stomach, which often deprive him of sleep for many successive nights. In this case I have found that nothing affords so much relief as the bromide of potassium, which he takes when troubled with these symptoms in half-drachm doses, one about seven o'clock in the evening, and again at bedtime, with the effect of inducing sleep without the least unpleasant consequence.

The three next are cases of delirium tremens, and in the first of them opium had been freely tried without success, but sleep was readily induced by the bromide, given in half-drachm doses every four hours until two drachms had been taken. The second was a very violent case, where the remedy was administered in the same way, until seven drachms had been taken, but, with each of the last half-drachm doses of the bromide, a pill with one grain of opium was likewise given. After that, sound sleep was induced; and the symptoms rapidly abated. The third was a milder incipient case, where the bromide alone in moderate quantity sufficed to calm the nervous excitement and induce sleep.

CASE 3.—The patient was a gentleman about 84 years of age, of dissipated habits, who had several times suffered from delirium tremens. I saw him, in consultation with Mr. Byerley, who had given opium largely without effect. The symptoms were like those of typhoid delirium; there was profuse perspiration, and the pulse was very weak and rapid. He had picking of the bed-clothes, and was quite unable to understand or reply correctly to questions. We ordered half a drachm of the bromide of potassium to be taken every four hours till he slept. After the fourth dose, which was

taken about two o'clock in the morning, he fell asleep, and slept for five hours. He awoke quite conscious, and when I saw him about midday all the symptoms were better, and he soon got quite well.

CASE 4.—I was summoned to see, in consultation, a gentleman about 38 years of age, who had on several occasions suffered from attacks of nervous excitement, his habits having been intemperate for several years. He had the usual symptoms—restlessness, tremor, profuse clammy perspirations, and no sleep for three nights. He was quite delirious, and saw imaginary objects, but talked rationally for a few seconds, and then wandered quite incoherently. The pulse was very weak (94), and the hands very unsteady. He had been freely purged, and I at once prescribed half-drachm doses of the bromide, with aromatic spirit of ammonia, every four hours, the alcoholic stimulant being limited to six glasses of sherry, which, however, he overstepped. The following day he was still incoherent, but less excited, and more manageable. As he had not slept, the bromide was continued, and he was ordered to have with each dose one grain of opium. The next morning he went to sleep at half-past six, and slept soundly for four hours. He awoke at intervals during the day to take food, but no further sedative was needed, as he became perfectly quiet and rational; and, having slept the third night, he was quite convalescent on the fourth day from my first visit.

CASE 5.—A gentleman, 33 years of age, a wine and spirit merchant, of nervous temperament, and rather irritable digestive organs, came under my care, suffering from vomiting. He was tremulous, perspiring, and had the frightened look of one who was suffering from over stimulation, though from constant tasting, rather than habits of intemperance. He had no delirium, but had suffered from restless, sleepless nights, as well as the vomiting. Having purged him with podophillum and aloes, I gave him fifteen grains of the bromide of potassium, with aromatic spirit of ammonia, three times a day, and half a drachm of the bromide at bedtime. This treatment soothed the nervous excitement, and produced sleep, and in a few days he got quite well.

CASE 6.—In the first number of this Journal, I published the case of a woman, 26 years of age, who had hemiplegia, preceded by convulsions, and where sleeplessness was a prominent symptom. She was most urgent in asking for something to make her sleep, not having slept at all for many nights, and being greatly exhausted by want of rest. Fifteen grains of the bromide were ordered to be taken at six in the evening, and again at nine o'clock. She slept the first night, and after taking it in this way for a few days, there was no further need of the remedy. She also recovered completely from the paralysis of the side.

These cases will suffice to show any one that may not have used the bromide in full doses to overcome sleeplessness, that it is a valuable remedy, which may be safely administered for this purpose in a variety of nervous affections.

I shall not now offer any observations in regard to the sedative influence of bromide of potassium on the sexual organs, further than to adduce one case where sleeplessness was a prominent symptom, and was relieved by this remedy.

CASE 7.—The patient, a gentleman about 28 years of age, had brought himself by his vicious habits to a state of extreme weakness and emaciation, and the nervous depression was verging on melancholic insanity. In addition to tonic treatment with steel and cod liver oil, which he took during the day, I ordered bromide of potassium at bedtime, in half-drachm doses. Finding this dose, however, insufficient, I gave forty-five grains, which caused sleep, and produced a beneficial influence on all his nervous symptoms.

The power which bromide of potassium has in controlling or curing epileptic seizures is another subject which I shall not enter into further than to express my conviction of its power and value in the treatment of this disease. Dr. J. Russell Reynolds states that its therapeutic effects are seen with the greatest amount of certainty and clearness when it is given to those who are suffering from paroxysmal diseases, and that its action is most conspicuous in epilepsy. I would refer on this head to his paper, and also to what

Dr. Bazire, the translator of Trousseau's lectures, has written on the same subject.* The evidence in its favour is such as to encourage a trial of the bromide in all cases where the remedy has not already been perseveringly given in sufficient doses.

The bromide has been used with more or less benefit in many other nervous disorders, such as mania, hypochondriasis, chorea, vertigo, head-ache, and local affections. I gave it lately with very good effect to a young lady who had long suffered from hysterical difficulty in swallowing. Dr. Begbie states that he has prescribed it successfully in some cases of diabetes; and Dr. J. Russell Reynolds has given it with great advantage in certain nervous affections characterised by sudden, distressing, but indefinable feelings in the epigastrium and abdomen, which he attributes to disturbances of the vaso motor system. A case, which might be embraced in this group of anomalous nervous affections, and where there was disturbance of the circulation in the head, with uneasy sensations in the abdomen, was quickly removed by bromide of potassium, after other means had been resorted to ineffectually.

CASE 8.—A gentleman, about 45 years of age, came under my care, who had formerly been stout and plethoric, at which time he suffered much from bleeding piles, but had for some years become less stout and had almost ceased to be troubled by the piles. He had distressing sensations at the epigastrium, loss of appetite, and flatulence, but he was most alarmed by some head symptoms, pain, giddiness, and floating specks before his eyes. There was no heat, increased action of the vessels, or any sign of determination of blood to the head, but, on the contrary, the pulse was very weak, and the countenance paler than natural. He took steel with ammonia, but, still suffering from the same symptoms, he went to Harrogate for ten days, and took the saline sulphur aperient water, which improved the condition of his digestive organs, but did not remove the uneasy sensations at the epigastrium, or in any degree diminish the head symptoms. On his return I prescribed 12 grains of the bromide, to be taken three times a-day, in a tonic infusion, with some

* "The Practitioner," July, 1868.

aromatic spirit of ammonia. This had an immediate effect, in relieving all his symptoms and improving his appetite also, and within four days he said that, whereas he had been quite unfit for any business, he felt fresh energy and was able to face anything.

I shall now advert to what has been called bromism, or the effects which may be produced by the excessive use of this salt when it is taken in full or considerable doses for long periods. The following case is a good illustration.

CASE 9.—A lady, about 47 years of age, whom I had previously attended occasionally, came under my care in November, 1865, on account of pain at the stomach and vomiting. There was constipation and very dark coloured motions, which seemed to be coloured by blood, as they got blacker by purging. On examination of the epigastrium, a tumour, the size of a small egg, was found in the situation of the spleen. She was seen by Dr. Vose also, and we both thought it might prove of malignant nature. By blistering, however, attention to diet, and other means to relieve the dyspeptic symptoms, and finally by the use of cod liver oil, which improved the general health as it had often previously done, the tumour gradually decreased, so that towards the end of the year it could scarcely be discovered. In the spring she went to Edinburgh, and put herself under the care of one of the leading physicians there, who prescribed bromide of potassium, the dose of which was increased to about a scruple thrice a day. She was more or less under his care all the summer and autumn, and she was so strongly impressed with the belief of the necessity of its continuance for the removal of the tumour, or what remained of it, that she clung to it with great tenacity. She lost her father in the autumn, and at that time her health was so bad that it was thought she could not long survive. In November, 1866, she returned to Liverpool, but did not place herself under my care for a fortnight after, as she did not wish to have the treatment of her Edinburgh adviser interfered with. Her friends, however, found that she was getting extremely weak and ill, and I was therefore sent for. I found her very emaciated and weak, and of a peculiar pallid colour. She was also inclined to doze, so that she often dropped off to sleep. There was remarkable slowness of speech, and difficulty in collecting the ideas and

expressing them. The extremities were cold, and the pulse slow and very weak. She was fearfully depressed, and frequently shed tears. There was no tumour whatever to be felt, and therefore no indication for continuing the bromide. The symptoms were such as might have been partly due to malignant disease, but I thought they were chiefly caused by the protracted use of the bromide, and I insisted on it being relinquished. I improved the diet and gave stimulants and tonics, with cod liver oil; in fact, returned to the original treatment she had left off on going from Liverpool. The rapidity with which she recovered, getting colour, strength, flesh and spirits, was surprising, and showed me that her condition and symptoms were entirely due to the excessive and protracted use of the bromide. She has continued perfectly well.

I was not then aware that Dr. Bazire had described a condition precisely the same, which was induced by the protracted use of the bromide of potassium. "When given," he says, "in large doses, such as thirty and forty grains, two and three times a day, it produces very striking symptoms in about ten or fifteen days. The patient at first complains of a dull headache, becomes listless and apathetic, with an expressionless face and lustreless eye. His intellect is clouded, his mind confused, and he is unable to concentrate his thoughts. There is slowness of perception, and questions have to be asked several times before their meaning is understood and an answer can be obtained. If, when these symptoms have begun to show themselves, the medicine be continued, hebetude follows, with inability to think, and a kind of stupor resembling that of the first stage of typhoid fever, together with drowsiness, somnolence, and constant dropping off to sleep. In no case have I seen delirium or hallucinations. The pupils are dilated, and contract very sluggishly under the influence of a strong light; the sensibility of the conjunctiva is so deadened that a finger may be passed with impunity over the surface of the eye-ball without producing winking. Hearing loses its usual acuteness, and it is only by speaking in a very loud voice that the patient can be roused from his stupor."

These symptoms are similar to what I witnessed in the preceding case; and Dr. Bazire has described effects of a less severe

character, but with an eruption of boils, occurring when the bromide is taken for much longer periods, in ten to fifteen grain doses, twice or thrice daily.

The chief object of this Paper having been to give practical illustrations of some of the uses of bromide of potassium, I shall not enlarge on its *modus operandi*. It would seem, however, that it produces a direct sedative effect on the whole nervous system, especially the sensory and motary nerves, and that it has a power of controlling irregular vascular action. According to MM. Damourette and Pelvet, it acts as an anæsthetic on the nervous centres and cord on the one hand, and on the mucous and tegumentary surfaces on the other. It diminishes muscular irritability, and thus has an extensive effect on the muscular organs of digestion, respiration, and urinary secretion, as well as the striated muscles.

A remedy having so extended an influence through the nervous system must admit of a great variety of practical applications in the treatment of disease, and there is reason to believe that, as it becomes more generally known, it will be increasingly used as a medicinal agent.

CASES OF CHOREA,

WITH REMARKS,

BY DR. OXLEY,

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CASE 1.—Female, aged 7 years. Admitted Nov. 1st, 1864; discharged cured Jan. 26th, 1865. A fair, blue-eyed, anæmic child. A week ago she became very restless at night, and since then has gradually lost power over her limbs and speech. She is unable to stand alone, and cannot articulate. Tongue foul, bowels costive; pulse 110, weak and jerky.

Ordered a calomel and jalap purge, and five-grain doses of the ammonio-citrate of iron, in half an ounce of infusion of quassia, three times a day.

For some days this patient seemed to get much worse, and was with great difficulty fed, or prevented from injuring herself. Sleep seemed quite out of the question. A draught, containing ten drops of tincture of Indian hemp, was given every four hours. This was followed by marked improvement, and was discontinued at the end of a week. She was re-admitted in the following May, with a similar attack, treated much in the same way, and discharged cured in August.

CASE 2.—Female, aged 9 years; admitted as an out-patient Dec. 24th, 1867; discharged cured April 23rd, 1868. A slightly built anæmic child. A week ago, while nursing her little brother, he took a fit, and died in her arms; this frightened the child very much, and soon after her mother noticed something strange in her manner and gait. She dragged the left leg after her, her arm hung by her side, and she was not able to use it as before. Has never had scarlet or rheumatic fever. No abnormal heart sounds. This case is one of only slight chorea, there being rather symp-

toms of paralysis than of chorea. She was treated with ten grains of bromide of potassium twice a day.

CASE 3.—Female, aged 8 years; admitted Sep. 27th, 1867; discharged cured Oct. 10th. A pale, delicate looking child. A month ago it was noticed that, after starting up from a dream, in which she seemed to have been frightened, she had lost control over her right side, and looked like a silly person. Three months ago she had small pox very severely, and since then has not been at all strong. The chorea is confined to the right side, and is accompanied with more than the usual loss of power. She looks at one with a vacant, idiotic stare, and is constantly twisting and turning; the bowels are very constipated, and have been so for some time back; pulse weak and jerky; starts very much in her sleep; heart's action irregular, its impulse being greatly increased by any slight cause. Treatment: purgatives, and the ammonio-citrate of iron; a tepid salt water bath at bedtime.

CASE 4.—Male, aged 10 years, sallow complexion, small for the age. Came under my notice Sep. 24th, 1866. Five months ago his feet swelled, and he made very little water. A week ago it was noticed that he twitched the left arm when standing still, and dragged the leg of this side after him. Had a fit when four years of age. Has the usual choreic symptoms in a very marked degree. The bowels are regular, the tongue clean; pulse 110, and very weak; the feet are cedematous: he rambles in his sleep. Has never had scarlet fever or rheumatism; has a trace of albumen in his urine, but no casts; the heart's action is feeble, but no bruit can at present be detected. Treatment: fifteen drops of the tincture of steel, three times a day. He was discharged cured Oct. 5th. He presented himself this morning (Feb. 20th, 1868), complaining of great pain in the region of the heart. I found increased impulse, and a loud systolic bruit over the base of the heart. Pulse 110, weak and thrilling.

CASE 5.—Female, aged 12 years; admitted October 15th, 1865; discharged cured October 26th. Tall, and rather slightly

built; pale, and anæmic. It was noticed that, after being sent home from a situation in disgrace, she seemed dull and out of spirits, and that she had not full control over her voluntary movements. On admission, both sides of the body were choreic, the right side being the worse. States that she had not been well fed in her place, and was kept very hard at work. Tongue dirty, breath foul; pulse 90, weak. She seems stupid, and does not answer questions readily, although the mother states that previous to the attack she was a sharp and intelligent child.

Treatment: tepid douch every night; compound jalap powder, and the ammonio-citrate of iron in ten-grain doses.

CASE 6.—Male, aged 12 years; admitted November 17th, 1863, discharged cured March 4th, 1864. A strumous looking lad. Has never had good health since he had measles, ten years ago. Both sides of the body are affected with chorea. Pulse 100, feeble; heart's action regular, with very little power. Treatment: tincture of iron, in ten-drop doses, three times a day, and a cold bath at bedtime.

CASE 7.—Male, aged 9 years; admitted January 27th, 1865; discharged March 13th. Re-admitted October 8th, 1867; discharged November 11th. A pale, anæmic looking lad, tall for his age, and very slender. Has never had rheumatism or scarlet fever. On admission, all control over the voluntary muscles was lost; the whole body was constantly in motion. It was, indeed, one of the worst cases which has come under my notice; there was no cause given. Heart's action extremely rapid and tumultuous. He could take no solid food, and had to be fed for some weeks. The ammonio-citrate of iron was given in ten-grain doses; and afterwards, the tincture of iron, with quinine.

This boy was re-admitted in 1867, with chorea and mitral disease. He was discharged cured of the chorea, but with heart disease of a serious character.

CASE 8.—Female, aged 10 years; admitted July 10th, 1865; discharged cured October 23rd. Has been getting thin for some

time back, and has hesitated in talking. When admitted, she could not stand, and was constantly and rapidly throwing the whole body into violent contortions; and it was found necessary to pad her bed. Food was with great difficulty swallowed, and she was nearly choked on several occasions. There was a history of a feverish attack, with a rash; no medical man saw her, and she soon recovered. Pulse 100, jerky and weak. One child in the family had died suddenly in a convulsion; the others were all strong and healthy. Treatment: Tincture of steel, and infusion of quassia, and a tepid bath at night.

CASE 9.—Female, aged 9 years; admitted January 27th, 1868; discharged March 23rd. The right side only was affected. The illness, which began some months before admission, was supposed to have been caused by the weak state in which an attack of scarlet fever had left her. The heart's action was regular. The choreic movements were not violent when lying down, and only became so when any attempt was made to use the muscles of the afflicted side. Treatment: tincture of steel, in five-drop doses; February 7th, syrup of strychnine, three times a day, the $\frac{1}{4}$ part of a grain gradually increased to $\frac{1}{2}$; this was continued to March 9th, when, there being no improvement, citrate of iron and quinine was ordered; this was soon followed by amendment, and the patient left the hospital quite well in a few weeks.

CASE 10.—Female, aged 18 years; admitted November 24th, 1864; discharged cured January 26th, 1865. The left side was affected, the heart was free from disease. The cause given was fright. Treated with iron and tepid douch. Had a previous attack four years ago.

CASE 11.—Female, aged 10 years; admitted February 25th, 1865; discharged cured May 15th. A pale, anæmic child, with no power over her voluntary movements. Was frightened by some boys, and came home with choreic movements of the mouth. This was thought to be a bad habit, and she was punished. When, however, the other parts of the body became affected, she was

brought to the hospital. Is not able to stand or speak; has a quick, irregular pulse; tongue dirty; bowels have not been opened for some days. Has never had any illness since an infant, but has always been nervous.

Treatment: tincture of steel in ten-drop doses, with a tepid douch at night.

She was re-admitted November 2nd, 1866, and discharged on January 24th, 1867.

CASE 12.—Male, aged 6 years; admitted March 18th, 1867; discharged April 22nd. Cause: fright. Previous disease: scarlet fever, four years ago. Treatment: tincture of iron.

CASE 13.—Male, aged 10 years; admitted December 3rd, 1866; discharged February 18th, 1867. No cause given. No cardiac disease. Both sides of the body implicated. Unable to stand alone. Has previously been a very healthy child. One of his sisters had chorea at the same age. Treatment: tincture of iron, in ten-minim doses.

CASE 14.—Male, aged 10 years; admitted July 15th, 1867; discharged August 26th. Pale, and badly nourished; has had very little food for some time back; has been severely beaten by his father for stupidity. The chorea came on gradually, the legs being first attacked. When admitted into the hospital, the choreic movements were so violent that he was kept from injuring himself with considerable difficulty. He had quite lost power over his speech, and had to be fed. Treatment: tincture of iron, with a tepid douch at night.

CASE 15.—Female, aged 11 years; admitted August 29th, 1867; discharged November 11th. No cause given. The chorea came on very gradually, the muscles of the face being implicated in the first instance. On admission, the whole of the muscles on both sides of the body are more or less subject to the irregular movements. Several members of the family have had either fits

or chorea. Treatment: cold douch at night, and the tincture of steel three times a day.

CASE 16.—Female, aged 9 years; admitted September 10th, 1866; discharged November 5th.

This child awoke up from her sleep in a state of terror, about eight days ago, and it was noticed that on her getting out of bed she was unable to stand, and could not control the movements of her arms or legs. Has now lost power over her speech, and has great difficulty in swallowing her food. Has had seat worms during the last six months, and has got very thin latterly. Treatment: tincture of iron, with infusion of quassia, and compound jalap powder.

CASE 17.—Male, aged 11 years; admitted June 11th, 1867; discharged August 26th. Had scarlet fever when five years of age; two years ago had an attack of chorea, and was attended at home. On admission, both sides of the body were choreic; tongue clean; bowels regular; heart's action irregular, a loud systolic bruit being heard over its base. Treatment: the ammonio-citrate of iron, in five-grain doses, three times a day. Left the hospital quite free from chorea, and had no abnormal heart sounds.

CASE 18.—Male, aged 10½ years; admitted August 20th, 1867; discharged November 4th. A tall, slender, anæmic looking lad. Has had chorea for three weeks. On coming into the Hospital, this boy was in a deplorable state, unable to talk or stand, and was with great difficulty fed. The bed had to be padded, in consequence of the violence of his movements. A loud double bruit was heard on auscultating, the cardiac dulness was much extended, and there was very tumultuous action of the heart; the breathing was rapid; the jaws were snapped together with great noise. The tincture of Indian hemp was given in five-minim doses every four hours, with great benefit; iron was at the same time administered. He got better of the chorea very gradually,

there being persistent mitral disease and chlorosis. There was no history of rheumatism or scarlet fever.

CASE 19.—Female, aged 9 years; admitted January 27th, 1868; discharged cured April 20th. Pale, delicate looking child. Chorea is attributed to a fright which she received at school. Both sides of the body are choreic. Has no heart disease.

Treatment: compound jalap powder; tincture of iron for two weeks, when strychnine was given for six weeks, in gradually increasing doses. There being no improvement, iron was resumed, and she was discharged quite well, after having been nearly three months under treatment.

CASE 20.—Female, aged 11 years; admitted June 4th, 1868; discharged cured. A healthy-looking brunette. Eight weeks ago, it was noticed that she was continually pushing out her tongue. This soon became complicated with twitchings of the mouth, and a sensation as if a ball was rising in her throat. Soon after, she began to complain of pain in the right leg and arm. This was followed by choreic movements of these limbs.

Had scarlet fever five years ago, but made a good recovery. Her brother had a nervous attack when two years of age, brought on by a fright. On admission, she had well marked chorea of the right side; is very hysterical, and complains of a rising in her throat. Has pain in the right leg; is well nourished; has no abnormal heart sounds. Tongue clean; pulse 110, regular, but feeble. An aunt and a cousin had to be confined in Rainhill asylum, with maniacal chorea. Treatment: eight minims of the tincture of steel, three times a day, with a tepid douch at bedtime.

Table of Age and Sex of Forty-one Cases of Chorea, admitted to the Liverpool Infirmary for Children.

Age.		Male.		Female.		TOTAL.
2 years	-	...	-	1	-	1
4 "	-	...	-	1	-	1
5 "	-	1	-	...	-	1
6 "	-	1	-	...	-	1
7 "	-	2	-	2	-	4
8 "	-	3	-	1	-	4
9 "	-	4	-	3	-	7
10 "	-	2	-	5	-	7
11 "	-	3	-	10	-	13
12 "	-	...	-	2	-	2
		<hr/>		<hr/>		<hr/>
		16		25		41

Remarks.—It will be seen, on reference to the table giving the age and sex, that there is a much larger proportion of females than males, viz., 25 of the former to 16 of the latter. This excess of females is not noticeable until we arrive at a certain age, up to which the males exceed in number the females. Thus, under ten years, we have 11 males and 8 females; while, over that age, we have only 5 males to 17 females.

It is interesting to notice that in eight cases the cause given was either fright or mental distress. Case 2 is an example, in which the evidence of fright being the cause is beyond doubt; and the fact of the infant brother dying in a fit is suggestive of an hereditary disposition to disorder of the nervous system.

Heart disease was discoverable in four cases (4, 7, 17, 18), and in two has persisted to this date.

Most of the children were wanting in stamina, and had not enjoyed good health for some time previous to the attack.

In some cases (8, 15, 20), several members of the family had suffered, either from chorea, hysteria, or fits; in one (20), an aunt and a cousin had been in confinement for maniacal chorea for two or three months, and the mother stated that she was often very hysterical.

The duration of the disease varied from 11 to 120 days, the average being about 59 days. This is giving the utmost limit, as the children were, in all the cases which have been given, kept under treatment until quite well.

The *treatment* pursued has been, for the most part, simply with the view to improve the "general tone," as the chorea seemed to depend upon much the same condition as we find in hysteria. The drug most likely to answer this purpose is iron, and of its preparations, the tincture of steel, or the ammonio-citrate of iron, answers the best. When a sedative was required, the tincture of Indian hemp proved most useful, producing calm and quiet sleep at a time when the case seemed hopeless from the unceasing jactitations. The cold or tepid douch every night before going to bed is an important addition to the treatment, and produces a remarkable sedative effect, and in all cases where it was used seemed to be of great benefit; in no case was the shock which it produced injurious.

Bromide of potassium was administered in one instance (Case 2), but, as it was a case of only slight chorea, one could hardly form an estimate of its value. Attention to the state of the alimentary canal is in all cases imperative, as usually the bowels act very irregularly.

In cases 9 and 10, strychnine was given in gradually increasing doses, but with an unsatisfactory result, the patients making no improvement during its exhibition.

There is no doubt that the tendency in this disease is to convalescence, except in rare cases, where the chorea depends upon some serious lesion of the nervous centre.

Judging from the cases which have come under my notice, the disease seemed only to exist while the vital powers were below par, and immediately on there being an improvement in the general health, the symptoms of chorea began to abate.

I have no doubt that the drugs which have been so much praised for their good effects in curing this disease have produced this result by their alterative or tonic action, combined with, what is of the utmost importance, a good nourishing diet.

NOTE ON THE ESTIMATION OF STRYCHNIA.

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In the absence of any published method of accurately determining the amount of strychnia in organic fluids, it may be useful to describe the process for estimating this alkaloid which I have adopted during the last two years. This method has been employed in several cases of interest, the most recent of which is noticed in the present volume, by Mr. Puzey; and it has been found to yield results which are correct to the $\frac{1}{1000}$ th of a grain.

Description of the process.—The alkaloid is first isolated by a modification of Stas's well known method, using chloroform instead of ether as the final solvent. The residue adherent to the dish after the evaporation of the chloroform is then carefully dissolved in very dilute and pure hydrochloric acid; the liquid is transferred to a beaker and the dish is washed into the beaker with water acidulated with hydrochloric acid. To this solution, containing a salt of strychnia, there is added a quantity of solution of the iodides of mercury and potassium sufficient to precipitate all the strychnia. The precipitant is best prepared by dissolving 271 grains (1 at.) of pure corrosive sublimate, and 996 grains (6 ats.) of iodide of potassium in a gallon of water. The white precipitate is allowed to stand for some time to settle, and the liquid is then decanted into an accurately weighed filter of Swedish paper; the precipitate is washed with water, the washings being passed through the filter, and finally it is brought upon the filter, washed, dried at 212° Fah. and weighed. The weight found *minus* the weight of the filter paper is then multiplied by the factor 0.365; the product is the amount of strychnia. The factor 0.365 is found thus:—

The white precipitate consists of $C_{21}H_{22}N_2O_2HI, HgI_2$, the molecular weight of which is 916; the molecular weight of strychnia is 334.

$$\begin{aligned}\text{Therefore as } 916 : 334 :: 1 : x \\ = 0.365.\end{aligned}$$

Thus every unit of the white precipitate contains 0.365 of the alkaloid. A similar precipitate occurs in the case of other alkaloids, *e.g.* brucia; and it is therefore desirable to prove the presence of strychnia in the precipitate. Caustic potash does not decompose it, and the alkaloid cannot be separated out; but the ordinary tests may be applied to the dry precipitate; the addition of a drop of concentrated sulphuric acid only occasions a brown colouration which does not interfere with the development of the purple tint on the addition of a crystal ferricyanide of potassium nor with the subsequent play of colours which constitutes what is known as the colour-test of strychnia.

A standard solution of iodide of mercury has been employed volumetrically by Winchler of Darmstadt, and Mayer of New York, for the estimation of alkaloids; but the volumetric method does not admit of the same accuracy as the gravimetric method detailed above.

Verification of the process. To test the accuracy of the process, trial experiments have been made with known quantities of strychnia. A centinormal solution was prepared by dissolving .334 grammes of pure strychnia in 100 cubic centimetres of water acidulated with hydrochloric acid;—10 c.c. of this solution contain .0334 grammes, or 10 measured grains contain .0334 grains of strychnia.

With this solution, the following experiments were made :—

Strychnia taken.				Found.
I.—10 c.c.	containing	.0334	grammes.	.03358
II.—10 c.c.	„	.0334	„	.0321
III.—20 c.c.	„	.0668	„	.0675
Mean04458
Difference00014 grammes.

This difference calculated into grains equals $\frac{1}{1600}$ of a grain.

ON THE MECHANICAL AND PHYSICAL EFFECTS OF NARCOTICS ON THE BRAIN,

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It is probable that many medicines, the ultimate effects of which on the animal economy seem to be similar, and which are therefore classed together in a common category, differ widely in the manner of producing such effects; some, for example, acting immediately on the textures to which they are carried by the circulation, and doing nothing more, while others have super-added to this their primary action secondary and collateral effects of a very marked character. Increased or diminished pressure of blood, increased or diminished rapidity of its flow, and many other analogous conditions are such indirect effects; and these sometimes are so considerable as to be of equal importance with the more direct chemical actions produced by the medicines that cause them.

In the following paper, I shall briefly detail a few observations and experiments which I think serve to illustrate the above proposition so far as the action of some of the chief agents usually termed narcotics is concerned. It should be stated perhaps at the outset that all the experiments were made on rabbits; and that by the expression, "mechanical and physical effects," is meant such changes as could be observed by the naked eye in the colour or size of a portion of the brain exposed by the removal of the superjacent bone and dura mater. The agents employed to produce insensibility were sulphuric ether, chloroform, carbonic acid, carbonic oxide, nitrous oxide (or laughing gas), the vapour of bisulphide of carbon, morphia, and atropine. Other narcotics would have been also used had time permitted. It will be only

necessary to narrate the first experiment in detail, as in the general method of proceeding all the others resembled it. It was performed on August 22nd, 1866, for the purpose of determining whether there was any variation in appearance in the brain of an animal rendered insensible by the inhalation of sulphuric ether. Anæsthesia having been first produced by means of chloroform, a crucial incision was made in the scalp, and then a triangular piece of the skull cut through with a very fine saw. This was removed as carefully as possible, as well as a piece of the fine dura mater corresponding to it in size, the blood stanching, and the animal allowed to recover. When sensibility was completely restored, there was nothing unusual observable in the exposed brain. It was of the ordinary light colour, and its upper surface just fitted against the inner face of the cranial bones, being neither protruded through the artificial orifice, nor depressed within the cranium; while the little blood that oozed was of a bright arterial hue. Sulphuric ether was then administered by inhalation (care being taken during the administration not to exert any pressure on the neck), when the following changes were observed. The brain became forcibly protruded through the opening in the skull, till it stood out as a tense tumour considerably above the external surface, concomitantly with which change the blood rapidly acquired a dark purple colour, that contrasted very strongly with the bright hue of a minute or two previously. The ether was then removed, and after a short interval chloroform substituted with exactly the same result. On removing these, and allowing the animal to recover, the brain speedily sank to its ordinary level, and the blood regained its bright appearance.

This experiment was performed several times, and on several different rabbits, with as much care as could be used, and always with similar results—a tense tumour of the brain, and a very dark colour of the blood, being uniformly produced. What do these two changes signify? And are they connected with the causes of the insensibility or not? The explanation generally, and probably truly, given of the deepened colour of the blood in the vessels would be that it is due to a non-oxygenation of that fluid, and to its being in the condition of venous, rather than of arterial blood. Whether

a mere alteration of colour, all other things remaining unchanged, could produce anything like the intensity of tint observed in the cases mentioned is perhaps fairly open to question. It seems probable that for the production of such an effect there must be congestion. Capillary vessels must be distended. The corpuscles, instead of moving in swift succession, must be brought to a standstill, or at most roll but sluggishly forwards. Does congestion exist in the brain of the rabbit when narcotised by chloroform? And, if so, will it explain the forcible protrusion of the cerebral mass which was witnessed? This protrusion was such that the brain must have been subjected to considerable pressure, notwithstanding that it was free to expand to a certain extent through the artificial opening. Of course, if no such opening had existed, the compression would have been still greater. Was this protrusion secondary to congestion, and the congestion itself secondary to a condition of stasis following from the retention of an abnormal amount of carbonic acid in the blood; and had either or both conditions anything to do with the production of insensibility? These are questions which I would suggest rather than presume to answer. I do not venture to affirm that the effects observed on the rabbit would be seen in man; though, in the absence of any such difference in the cerebral circulation in man and the rabbit as would seem competent for the production of so great a difference of result, it seems probable that they would.

This may be confidently said, viz., that whenever rabbits are rendered insensible by the inhalation of chloroform or ether, the contents of the cranium are greatly increased in bulk and the colour of the blood much darkened.

Carbonic acid and carbonic oxide differed somewhat in the symptoms they produced, though the effects on the brain seemed to be similar. The former agent was employed by burning a pan of charcoal in a close bin in which the rabbits were confined; the latter by passing the gas through a delivery tube into a large inverted glass jar containing the animal, after generating it in the usual way by means of oxalic and sulphuric acids, and depriving it of carbonic acid by solution of potash. Under the influence of the carbonic acid, there was simply a gradually

increasing somnolency ending in deep narcotism ; whereas, when the carbonic oxide was breathed intense excitement came on, the creature making the most violent efforts to escape from the jar, though these efforts were speedily followed by complete insensibility. In both cases there were the same appearances in the brain as when chloroform and ether were used.

That such physical causes of narcotism as the conditions of the brain in the cases already noticed might seem to suggest are not, however, essential to the production of that state appears evident, from the absence of such conditions when some other agents were employed. When two grains of morphia, for example, were administered by subcutaneous injection, and the brain exposed, there was neither protrusion nor change of colour. Nor when—the animal being still under the influence of the morphia—a solution of atropine was injected, and the pupil made to pass under its influence from a state of contraction to one of extreme dilatation, was any change observable. Of course it is not pretended that this kind of experiment is sufficient to disprove the production of very different physical conditions by the two alkaloids, morphia and atropine, in the parts through which they circulate. Changes of a kind too minute to be observed with the naked eye might or might not be caused. So far, however, as mere unaided observation goes, their physical effects are similar. I might remark here, in corroboration of careful observations long since made by others, that the action of atropine was much more evanescent than that of morphia. The pupil was contracted under the influence of the latter. The atropine was then introduced, when it became dilated ; but the dilatation passed away, and was succeeded by contraction caused by the original dose of morphia.

The three remaining agents, viz., sulphuretted hydrogen, nitrous oxide, and the vapour of bisulphide of carbon, were passed into the inverted glass jar containing the rabbit, just as was the case with the carbonic oxide. Under the influence of the first of these there was no excitement whatever. As it mingled in greater and greater proportion with the atmospheric air in the jar, intense drowsiness, ending in deep coma, came on ; and, concomitantly

with the supervention of this state, the blood around the wound in the cranium became of a deep black colour. The change was greater than in any of the other cases, the colour being quite pitchy. But though I looked carefully, I could not see any protrusion of the brain.

When nitrous oxide was breathed, by another rabbit, in the same jar, there was on the contrary great protrusion, but no change of colour, although as deep an insensibility was produced. In this case also the effect was very evanescent; for in three minutes after exposure to the air the rabbit was up and running about, whereas the one which had breathed the sulphuretted hydrogen never rallied from the coma.

The vapour of bisulphide of carbon was given by soaking a small sponge fixed in the top of the jar with the liquid bisulphide and then inverting it over the rabbit. The vapours instantly diffuse themselves in such a case. The first symptom was intense excitement. Violent efforts were made to escape, which were followed by convulsions and coma. Here again there was no perceptible protrusion of the brain. There was a good deal of pulsation in its vessels, but, though it could be plainly seen beating against the inner face of the cranium, it was never forced through the orifice that had been made. Nor was there any *great* change in the colour of the blood. It certainly was a little darker than natural, but not nearly so dark as in many of the other cases.

The experiments related were undertaken with a view to ascertain by such means as were employed, and so far as it was possible to ascertain by such means, whether there might not be a physical cause,—as, for example, pressure,—for most cases, as there undoubtedly is for some cases, of narcotism. Against such an idea they certainly seem to militate, the physical conditions of the brain which follow the administration of the narcotic agents being so very dissimilar. There is nothing, however, in them to disprove the idea that, in cases where pressure and other competent conditions do exist, they may be causes, if not the main causes, of the insensibility. The narcotism induced in the three rabbits, beneath whose skins I injected morphia, was not so deep as it

was in those animals which were made to breathe one or other of the gases; and this may possibly account for some difference in the appearances. In ten minutes after the injection of a solution of two grains of morphia, a half grown rabbit lies utterly unable to move, breathing very slowly, but having its eyes partly open. The removal of a portion of the cranium seemed to give no pain under such circumstances. The introduction of the atropine was not followed by any diminution of the coma; and two of the animals died within two hours, uttering a cry and being convulsed immediately before death.

ON REST AND POSITION IN THE TREATMENT OF MEDICAL DISEASES,

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THE importance, nay the absolute necessity, of rest, mechanical or physiological, in the treatment of a large number of diseases of a surgical nature has long been recognised, and, by the comparatively recent labours of some eminent observers, the whole subject, so far as regards these affections, has been most ably worked out; but among those diseases considered as more strictly medical, the application of this principle has been anything but extensive, and it appears to me that, though of course its usefulness must be necessarily much more limited where internal organs are affected, whose constant action is essential for the maintenance of life, than in those cases where external parts are implicated, which can be relieved from the performance of their ordinary functions without interfering with the existence of the patient, yet there are many diseases, frequently too of a grave character, in which rest and position exercise a most important influence for good, not only in aiding the action of other remedies in the direction of recovery and preventing the occurrence of complications, but also themselves sometimes actually leading to a cure, and not unfrequently relieving symptoms and prolonging life, where recovery is not to be hoped for. It shall be my endeavour, so far as space will admit, to consider the subject in relation to some of the more important affections which are met with in ordinary medical practice.

There is hardly any acute disease more commonly met with, or of a more distressing character, than Acute Rheumatism. So

far as the joints are concerned, there is no necessity of enjoining rest, for the patient will find it not only absolutely necessary to keep quiet on account of the pain which movement produces, but will often be unable to move in the slightest degree, there being not only an unwillingness to stir, but a condition of almost absolute helplessness; but even here it will often be found, that position, and proper arrangement of the limbs on soft pillows, aid materially in lessening pain, and securing the comfort of the patient,—a by-no-means undesirable end, seeing that the pain in this affection exercises a most depressing influence upon the patient. It is, however, principally on account of its tendency to implicate a most important internal organ, viz., the heart with its investing membrane, that I allude to this disease. Endocarditis and pericarditis are what we most fear, as being complications not only dangerous in themselves, but also leading to after-consequences of a very serious nature, and therefore it ought to be our chief aim and duty to ward them off by every means in our power. One of the most obvious of these means is to endeavour to keep the heart in as quiet a position as is practicable. Though the inflammation which affects the endocardium or pericardium is principally due to the circulation of a poisoned blood, yet it cannot be doubted that, in proportion to the degree of rest which can be procured for the heart, the less will be the chance of these membranes becoming involved.

In a former volume of the *St. Bartholomew's Hospital Reports*, Dr. Farre advocates the free administration of opium in cases of rheumatic pericarditis, with the view of keeping the heart quiet; I would go a step further back, and say, that in order to *prevent* the advent of any inflammation about the heart, opium should be given with the same object, viz., to produce a constant sedative action upon this organ. It is a drug very generally used in cases of acute rheumatism, but only with the view of relieving pain, and it is therefore not given to the necessary extent. I generally give it in the form of a pill, containing one grain of opium, and this is repeated from every eight to every three hours, according to the requirements of the case. The results have been very satisfactory; for, among a large number of cases of acute rheu-

matism admitted into the Northern Hospital under my charge, there has not been a single instance in which either endocarditis or pericarditis developed itself while the patient was in the hospital, and I cannot but attribute this, at all events in part, to the extensive use of the opium, combined with measures for maintaining the most absolute rest of the body, and the avoidance of anything in the diet of a stimulating nature. I have had no experience of the employment of digitalis or the veratrum viride, which doubtless would be very valuable as sedatives to the heart; but they have this objection, that they are very depressing agents, and the patients are as a rule quite depressed enough, especially in hospital practice, while opium has the further advantage of relieving the pain which is such a source of suffering.

When inflammation affects the peritoneum, one of the main principles of treatment which has been long recognised is to maintain the surfaces in as complete a state of rest as possible, and with this end in view, the peristaltic action of the intestines is entirely checked by the free use of opium. I have already alluded to its employment as a sedative to the heart, when the pericardium is similarly affected; but there is one serous membrane, viz., the *pleura*, in the treatment of inflammation of which the idea of procuring rest has hitherto been entirely overlooked. In cases of synovitis affecting joints, this is one of the chief points to which the surgeon attends, and the condition of things in pleurisy bears a sufficiently close resemblance to those met with in synovitis to suggest to us that the same principle might be adopted with advantage. Obviously, if the friction of the inflamed surfaces against one another can be prevented, or even considerably diminished, they will be less likely to pour out the large amount of lymph and fluid which often produces such lamentable consequences, and will be left in a far more favourable condition for the absorption of whatever fluid may be exuded, and for rapid adhesion to take place, before the lung becomes compressed to such a degree that it cannot recover itself. Any one who has seen a case of acute pleurisy in the early stage, cannot fail to have observed how the patient instinctively restrained the movement on the affected side, and must have felt that if, following the hint

thus given, he could aid by any means in keeping the side motionless, he would be conferring a great boon, both in relieving the symptoms which cause so much distress, and leaving the parts in a condition for passing through the several stages of the inflammation in a manner most conducive to the well-being of the patient. This object can be carried out, to a great degree at all events, by *mechanical means*; and I would suggest that one of the first things that should be done, in the early stages of pleurisy, is to limit as far as possible the expansion of the affected side, taking care however to leave the healthy side quite free to perform its duties. In order that this principle may be successful, it must be carried out effectually, and the plan that I adopt is as follows:—strips of emplastrum roborans, about five inches wide, are laid firmly over the affected side, extending from the spine behind, round to the middle of the sternum in front, and covering the whole side, from the upper part of the chest down to the lower margin of the ribs; over these two or three layers of strips of bandage, of the same length, and soaked in a mixture of gum mucilage and chalk, are placed, also with considerable firmness; the whole is then rapidly dried by applying heated sand-bags, and thus in a very short time a firm casing is formed, almost completely preventing movement on the one side, while it leaves the other quite free to expand. It may be objected to this that it is difficult of application, and not conducive to cleanliness or comfort; but practically it will be found that it can be easily applied, and, with a little care, without interfering with the above conditions. But even if these objections were valid, they are not of sufficient importance to deter us from adopting this treatment, provided it can be proved to be of service in obviating those dangerous results, which now by no means seldom follow an attack of the disease under consideration. Of course any other plan might be carried out, if it effectually secured the desired rest, and there need be no interference with the medical treatment which any individual practitioner might feel inclined to adopt. Contrary to what is stated in some standard works on diseases of the chest, my experience has been that *acute idiopathic pleurisy* is not a common disease, even in hospital practice, and it is still

more rarely met with in its early stages; consequently, the opportunities I have had of testing the effects of this treatment have been so far very few; and I throw it out more as a suggestion for future trial than as one the value of which has been established by extensive practical application; at present I have but the results of two cases to record, but in these the means adopted seemed to answer very well, and the termination in each instance was exceedingly satisfactory. The first case in which I tried it was that of a rather elderly man, who was admitted into the Northern Hospital suffering from the usual pleuritic symptoms, the pain being very intense, and there was loud friction-sound to be heard. On applying the plaster and bandage as previously described, the pain was at once greatly relieved, a sense of ease and comfort was felt, and the breathing became quiet and regular, entirely losing its 'catchy' character. The subsequent course of the case proved equally satisfactory; very little, if any, fluid effusion took place, and the patient was discharged within a week quite convalescent. No medicine was given except a little opium. The other case was that of a young man, who, when admitted into the hospital, was also suffering much pain, but he had been ill for some days, and some fluid had been poured out. A similar application was made, and with the same favourable results, the fluid having been soon absorbed, and a speedy cure brought about. It is, however, not only in cases of pleurisy that this principle of keeping the chest at rest is of use, but it is also advantageous in certain other conditions; thus in *pleurodynia*, often an exceedingly troublesome and painful affection, I have found it of much benefit; and in a case of *pneumothorax*, resulting from the rupture of a tubercular cavity in the lung, it proved of the greatest service in relieving the urgent symptoms which were present. In this case, the right side was enormously distended and tympanitic, the liver being considerably displaced downwards and to the left; there was extreme pain, especially when the patient coughed, which he did very often, though he felt as if he had no power to perform the act, and tried to assist it by pressing on his side with his hands—a constant sense of urgent dyspnoea was felt. The effect of fixing the side was to give *immediate* and *marked* relief to these

symptoms; and although the issue in such cases must necessarily be almost certain death, yet, bearing in mind that it is the duty of the physician to alleviate suffering, as well as to restore to health, I think that the treatment I am now advocating is of great importance under circumstances like those described above.

Though perhaps belonging rather to the domain of surgery, I would say a few words here with regard to *chronic inflammation of the larynx*. It has for some time struck me, from observation of several instances of it, that it would be very advantageous in such cases to perform tracheotomy at an early period, with the view of affording physiological rest to the larynx, thus placing it under more favourable conditions for being restored to health; and I am glad to find that this treatment has recently been well advocated by Mr. Bryant. But I am of opinion that this principle ought to be extended further, and that, whenever there is chronic ulceration at the back of the throat of an extensive nature, and *threatening to invade upon the larynx*, as shewn by interference with the act of breathing, hoarseness, &c., if the results of treatment are not *speedily* favourable, tracheotomy should be had recourse to, as not only leaving the parts in the best possible state for being healed, a result which is otherwise obstinately resisted, but also as saving the patient from the risk of sudden death, which is apt to occur from œdema of the glottis, followed by spasm. A case of this kind recently happened under my care at the Northern Hospital, in which sudden death took place, though there were no specially urgent symptoms; the upper part of the larynx was found to be œdematous, and evidently a momentary spasm had completed the mischief. This and similar instances which have come under my own notice, and been mentioned to me by others, have impressed upon me the imperative necessity of having early recourse to tracheotomy, or perhaps laryngotomy, under such circumstances.

Dropsy is a symptom common to several forms of disease, and the principles of its treatment have to be guided to a certain extent by the nature of its cause; but there is one very important point that ought to be attended to in all cases, but which has not

received the attention it deserves, and that is the *influence of position and rest*. In some affections, dropsy constitutes one of the most serious symptoms, not only itself causing much uneasiness, but also leading to an unhealthy condition of the blood and system generally, and hence nothing that can in any way assist in its removal should be disregarded. It is of course especially when anasarca of the lower extremities or scrotum exists, that the results of position and rest are best seen. In such cases the legs should be kept *continuously*, and *for a long time*, in fact, until quite restored to their natural state, in the horizontal position, or even somewhat elevated above the level of the body, so that the fluid might not be under the influence of gravitation, while the scrotum should be raised by means of a soft pillow. It is not sufficient to attend to this for a brief period, or interruptedly, but it must be *persevered in*; and it is also of great importance not to neglect it in the early stages, before the fluid has collected to any great extent, for it is then that its effects are most marked. Cases are not unfrequently seen in which considerable diminution of the anasarca takes place during a night's rest; but, the patient being allowed to walk about during the day, it becomes as great as ever before evening, and thus no real progress is made, the vessels having to perform the same duty of absorption night after night, while they are hindered from regaining their tone and returning to their healthy normal condition. By obviating the re-accumulation of the fluid which has already been absorbed, the action of other remedies is materially assisted, while the vessels are left in a far better state for taking up what remains. In order to carry out this principle, it is not necessary that the patient should be confined to bed, indeed it is important in many cases that he should get up, all that is required being that the legs be kept on a couch or form, and not allowed to hang down. In some instances position alone, or merely combined with good diet, is sufficient to remove dropsy; thus several sailors from the same ship were admitted into the hospital with considerable œdema of the legs, for which no particular cause could be found, and they were all discharged in a few days, cured by rest and nourishing food. The dropsy of anæmia is also as a rule speedily

removed by position; and I have found attention to this point productive of much benefit in that resulting from cardiac or renal disease.

One very important means of relieving dropsy, that of Bright's disease more especially, is to act freely upon the skin by the aid of some form of bath, particularly the hot air or vapour bath; but it seems to me that the use of the bath in Bright's disease is not limited to the treatment of this symptom, but that it is a powerful means in our hands of taking away from the kidneys much of their labour, and thus keeping them in a state of physiological rest. It is a well-known physiological fact, that the functions of the kidneys and skin are performed in an inverse ratio, the one being active when the other is inactive. If then we can get the skin to excrete profusely, we shall by so much diminish the work the kidneys have to do, and thus necessarily leave them in the most favourable condition for being restored to health if the disease be not too far advanced, or at all events aid in retarding its progress. On this ground, I would advocate the regular and frequent use of some form of bath in cases of Bright's disease, *quite independently of the existence of dropsy*, and, if it could be had, none would act so well as the Turkish bath; but if not, the vapour, hot-air or warm bath might be substituted. From the observation of a large number of cases of chronic renal diseases, I have been led to the belief that it can often be traced, in the lower classes, among whom it is very prevalent, to the long-continued neglect of keeping the skin in a proper state of cleanliness and activity, especially when this is associated with habits of intemperance; the consequence is, that the skin ultimately ceases to act at all, its glands become blocked up, and perhaps in some cases undergo degeneration, and thus extra work is thrown upon the kidneys, leading at last to disease, which can therefore be best counteracted by endeavouring to excite the skin to the performance of its normal functions.

There are many other diseases in which rest proves a valuable aid towards recovery, and in which its influence has been to a certain extent already recognised, though it is still too often not attended to as it deserves, being merely looked upon as an agent

of secondary importance. Space will not permit me more than just to allude to a few of these. In the various forms of internal hæmorrhage, such as hæmoptysis and hæmatemesis, what appears to me of far greater moment than the administration of astringents, is to keep the patient in the horizontal posture *for some time*, quite free from all disturbing causes, and to lower the force of the circulation by means of a limited diet, and the use of such medicines as opium or digitalis. In the case of hæmatemesis, all solid food should be avoided, only small quantities of fluid being given, and indeed for a time it will be well only to allow the patient to suck ice. These measures should be continued until the ruptured vessels have had time to recover themselves, and all fear of recurrence of the bleeding is past. Attention to the matter of diet, with the view of affording physiological rest, is also of primary moment in the treatment of various affections of the stomach and intestinal canal, such as dyspepsia, chronic ulcer of the stomach, the ulceration of typhoid fever, &c.

Even as regards diseases of the brain and its membranes, though the removal of everything that can disturb the body, mind, or senses has always been considered important, at least in those of an acute nature, still it is not as a rule insisted upon to the extent it ought to be, particularly in chronic cases. There is no doubt that it is a point of the greatest consequence to attend to, and therefore it should be fully carried out, and that not merely for a brief period, but for a long time, even after apparent recovery has taken place. In chronic cerebral diseases, the desirability of mental quietude, intellectual and emotional, should be deeply impressed upon the patient, as affording the only chance of recovery; if neglected, it may lead to an acute complication, which would soon end in death. I have met with more than one instance in which some mental disturbance, generally of an emotional character, has been the cause of an acute attack, which has led to a rapidly fatal issue.

CLINICAL REMARKS UPON
 SYMPATHETIC IRRITATION AND INFLAMMATION
 FOLLOWING INJURIES OF THE EYE,

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No subject of surgical interest can hold a more important place in the mind of the surgeon than the consideration of the effects of injuries to the eye and its surrounding structures. Large numbers of such cases are continually coming under observation, both in hospital and in private practice, and I have selected from amongst them examples of several forms of such injuries, with their results, illustrative of the several phenomena most commonly observed in the progress of such cases generally. It will be necessary for us to bear in mind the nervous connections of the eye and its appendages, in order that we may better explain the several dangerous complications and conditions known as "sympathetic inflammation," and understand how they are brought about.

In regard to the power we possess of seeing one object with both eyes, anatomists explain it by the decussation of the fibres from both optic nerves, which takes place in the chiasma, or optic commissure. Thus each retina is composed of fibres coming from the two optic nerves; and as the one possesses, in common with its fellow, a special function, in the same manner does it participate in, and is influenced by, altered and diseased conditions affecting the other.

Furthermore, we must notice the very intimate and close connection that exists through the several nerves supplying the eyes with motion and sensation, and to this is due the sympathy in disease; in fact, we find that what is common to them in a healthy condition is also common to them in diseased states.

The eyes also receive a large supply of nerves directly from the sympathetic system, which are chiefly concerned in their nutrition; and, with reference to this system, Dr. Carpenter remarks, "It is well known that the sympathetic system is largely distributed upon the trunks of the blood-vessels, accompanying them to their minutest ramifications;" and again, "that these vessels contain an independent capillary power of regulating the supply of the circulating fluids, which is closely connected with the state of the nutrition and secreting processes." The interference with nutrition following injury to nerves is well evidenced in some consequences which have followed injuries to particular nerves. Thus division of the fifth pair of nerves, without any immediate mechanical injury to the eye, has been followed by death of the cornea; whilst injury to the spinal marrow may give rise to sloughing of distant parts, by interfering with nutrition directly through the sympathetic system of nerves.

With these few preliminary remarks, I will proceed to allude to some of the more mischievous consequences I have noticed, and which have led me to a close and anxious study of such conditions.

My observations induce me to believe that amaurosis following injuries to nerves at a distance from the eye itself, viz., about the head and face, is of the most hopeless character, and I have never yet found any form of treatment capable of arresting ultimate blindness. Fortunately these cases are comparatively rare. I will give the history of such a one; but, as they resemble one another in a remarkable manner, running much the same course, varying only in different constitutions, habits, and in extent, and as a rule ending in blindness, it would be useless multiplying them.

Miss M., when eleven years old, sustained a deep and severe injury of the forehead, implicating the right supra-orbital nerve. Ever since the accident she has suffered from severe *recurring* pain around the right eye-ball, vision becoming dimmer after each attack. During the attack the eye-ball becomes red and bloodshot, and very painful to the touch. A few days rest, with treatment, usually restores her eye to quietude. This condition

has gone on for eight years, and now (1865), vision in it is almost gone, and the *left* eye has lately suffered from the same symptoms, and she feels that it is passing into the same condition as the other, and that she will become blind. Excision of the cicatrix in the forehead, with a portion of the supra-orbital nerve, was proposed, but she declined to submit to an operation. I never after saw the poor girl, but have no doubt of the ultimate result of the case. The pathological conditions, observed by the ophthalmoscope, are, as a rule, simple atrophy of the retina and choroid, the gradual effects of "altered nutrition," the clear media of the eye, as well as the irides, looking apparently perfectly healthy.

Such cases are in great contrast to the forms of amaurosis following injuries to the eye-ball itself, where we see, after injury to one eye, the acute plastic forms of inflammatory action occurring in the other uninjured eye, which, though beginning slowly, soon assume the glaucomatous character, passing, generally, if not arrested by the most active management, into a state of general agglutination of the tissues by the organisation of the products of the inflammatory action. The iris, capsule of the lens, altered lens tissue, and the vitreous body itself, are all bound inseparably together, and the anterior and posterior aqueous chambers become more or less obliterated. The eye-ball, in the early stage, feels hard and full, but later on, when utter and complete destruction of function is effected, it shrinks to a mere stump. Patients having an eye in such a condition frequently apply for something to be done, as they *feel* that there remains some little power of vision, and they often beg for any operative procedure which may give them even a chance of restoration to useful vision. The following is a fair specimen of this form of mischief.

A young man, while at work, was struck on his right eye by a piece of iron flying off the chisel head, twelve months before I saw him. The cornea was severely lacerated, the iris prolapsed, and lens torn and dislocated. Acute inflammation followed the injury, which did not subside for some months, and ended in complete destruction of all vision, and an atrophied

eye-ball, but with a clear corneal 'patch.' Three months after the injury to his right eye, the *left* began to suffer from sympathetic irritation; congestion, and, in fact, general eye-ball-itis, which is really the best term to apply, followed, and completed the destruction of vision in the uninjured eye. The cornea was clear, and he could perceive daylight with this eye. A year after the first receipt of the injury he was sent to the Eye Infirmary under my care. The *right* eye-ball is shrunk and soft. No perception of vision. The cornea has a clear patch, and the iris is seen through it, discoloured, tied together by old plastic organised lymph. No pupil. He says that he now only suffers occasional intermitting pains, which he feels at the back of the eye-ball, extending around it and going to the left.

The *left* eye-ball is fuller and harder than natural. The cornea is clear and rather flat; anterior chamber small. The iris is of a muddy reddish appearance, and has lost all its normal, muscular-like, striated character; it is fixed by false membrane, which appears like a complete veil stretched across the eye. The pupil is perfectly closed, and the pupillary margin completely lost in the plastic exudation tissue, which has now become organised. The margin of the iris is bound to the anterior capsule of the lens, which has become opaque and cataractous, thus obliterating the posterior aqueous chamber, and most probably involving the ciliary processes and hyaloid membrane. He can make out daylight, as well as the flame of a candle when passed before the eye. After warning him that most probably I should fail in making him an artificial pupil, he was glad to submit to any operative proceedings I thought likely to be of use. I endeavoured, by a free incision through the lower margin of the cornea, to cut out a good sized piece of the altered iris and false membrane, and to make him an artificial pupil. I caught, with forceps of different forms, piece after piece of the iris, and appeared to have at last made a good clear pupil, but on examining the eye, four days afterwards, though no inordinate inflammation had resulted from the operation, I found, as usual, the edges of the new pupil again coalesced,

with scarcely any trace of the artificial pupil, excepting an apparent thinning of the iris and membrane at the central point. The man thinks the veil is thinner and the light stronger. A fortnight afterwards I again operated in the same manner, but with a similar result, the edges of the cut iris closing the new pupil. This is no uncommon case, but I believe almost the constant result, in these aggravated cases of acute sympathetic inflammation. I have been induced repeatedly to try again and again for the chance of affording some little good. Out of many cases, only in a few instances have I succeeded in giving relief. In one such, a labourer came to me after he had been operated upon nine times by different surgeons and in different places, and I was fortunate enough to succeed in establishing a clear small pupil, through which he was enabled to find his way about comfortably for eight years afterwards, when I lost sight of him. It was a good illustration, however, that want of success in one, two, or more attempts should not satisfy us in these cases, as it is frequently found that the small iridectomies, which these operations really amount to, have a beneficial effect; the irides occasionally improve after the first operations, and place the patient in a much better position for ultimate success, always providing that no shrinking of the eye-ball occurs, and that the power of the eye to discern day-light and passing objects before the eye remains.

If such results become in this class of cases almost a rule, it will readily be conceded that no effort upon the surgeon's part should be wanting to prevent these sad consequences to the patient, but that all due care, trouble and perseverance, for these cases are very tedious, should be exercised in their treatment. As medicines have utterly failed in arresting the progress of the disease, it is encouraging to find that surgery has within it the means at hand of giving relief to at least the majority of these cases, if it be applied sufficiently early, but boldly and without temporising; and I say it in no hesitating manner, from a long and sad experience in closely watching the course of these cases, that it is the duty of the surgeon, when he is called to such a case, and finds an eye utterly destroyed by

some injury, to excise it at once, just as he would amputate a limb crushed or mutilated to an analogous extent by mechanical means, or disorganised by disease; in fact, to reduce by his knife the wound to the simplest form consistent with the injury received. We place the patient in safety at once, in a week he is quite well, a glass eye removes the deformity, and all chances of sympathetic disease are for ever gone. Undoubtedly normal vision is seriously affected, but such a position of healthy vision with one eye will bear no contrast to the other side of the question, of utter and hopeless blindness.

W. F., gun-shot wound of the right eye. He was standing watching a pigeon shooting-match, 150 yards from, but opposite, the shooter. One shot penetrated the upper part of right cornea, iris and lens, and was lost in the eye-ball. He was sent to me next day. Feeling convinced that the shot was in the eye, and the eye utterly destroyed for all useful purposes, I wished to extirpate it at once; but, after submitting the case to a consultation, it was deemed better to wait for symptoms to arise in the left eye of sympathetic irritation before doing so; in three weeks after leaving the Infirmary the left eye became affected. I extirpated the right eye, and found the shot embedded in the choroid, retina, and sclerotic, about half-an-inch from the optic disc; he appeared to be relieved for a short time, but the relief was only temporary, sub-acute inflammation continued and ended in total blindness, and I think the poor fellow was nearly a year before all pain and irritation had subsided—with his health greatly impaired.

In September, 1866, a medical man was thrown from his horse while out visiting his patients, owing to his horse running away with him. He wore spectacles, and was pitched with his face against a load of sticks (cut hedges) lying upon the road side; his spectacles were broken into his eye, which was at once destroyed; cornea torn, iris, lens, and vitreous body escaped through the wound. His ankle was also broken. He lived some distance from Liverpool, and I was sent for ten days after his accident. I found him in extreme agony, with the eye-ball enormously inflamed and swollen, and standing prominently between the half open eye-lids. He was in intense pain, and felt

his other eye very tender and weakly. I at once recommended the destroyed eye to be extirpated, his friends would not consent, so I ordered the usual remedies in such a case; in about a week afterwards I was again requested to visit him. I found him in much the same state, but more exhausted and reduced; morphia and opium, with almost the continual administration of chloroform, affording him the only relief. He begged of me to remove the injured eye, as he felt that he should lose both if it were not done. I removed the eye, on the seventeenth day after the injury, and he felt immediate relief, and had no return of pain; he was quite well again *in ten days* so far as the eye was concerned, his ankle detained him much longer. I see him occasionally, he wears a glass eye, and his remaining eye is perfectly well, and vision in it as good as ever it was.

Another condition frequently presents itself to us in practice in cases where a patient has sustained severe injuries, destroying the usefulness of one eye, where no great sympathetic mischief arises for some considerable time afterwards, even as long as twenty years. I have such a case at this moment under my care, having the following aspect.

O. H., aged 50, a tall healthy-looking man, works in the Welsh slate quarries; twenty years ago he was injured in the left eye, by a piece of slate which he was splitting in the quarry; the cornea was lacerated, the iris prolapsed, and lens dislocated. He tells me that he bled considerably at the time, and was laid up in bed and confined to his house for four months, suffering great agony from the inflammation that followed. Vision in this eye was lost at the time of the injury, and never recovered; he has suffered from occasional painful attacks in the stump of the eye, but not to a severe degree until eighteen months ago, when he found that, after each painful attack in the old stump, the vision of his right eye became dim, the dimness increasing after each attack. Within the last few months, the right eye-ball has become red and inflamed; feeling that he was in great danger of losing the vision in his remaining eye, he came to me, and I advised the immediate excision of the left eye, and the man gladly consented, as he was quite satisfied that the condition of the

stump of the left eye was the cause of the mischief in his right eye. The case resulted most satisfactorily.

I have had a large number of very similar cases under my care, and I have treated them during the last four or five years by *excision* of the globe; but there is another mode of procedure, by what is called "abscision" of anterior half of the globe of the eye. This operation appears at the first view to be a simpler operation than excision of the entire globe; but it is not so, and it does not answer the purpose of giving complete permanent relief. Cutting through the sclerotic, the anterior parts of the choroid and retina, with the very great risk of the loss of the remains of the vitreous body and humour, is a far more serious matter than the mere division of the conjunctiva around the cornea, the six muscles of the eye, and the optic nerve; and in the time required for perfect recovery from the effects of the two operations is very different; an eye that has been abscised may be a month or two in recovering, while from the effects of extirpation of the eye-ball a few days, generally about a week, is all that is necessary; the beneficial effects of extirpation are felt at once, and remain for ever; of abscision, the relief is slowly felt, the cause of the mischief remains, and the mischief itself returns. The dissections of a great many eye-balls when this diffused sympathetic irritation has set in, has convinced me that it is entirely due to the dense fibrous structure of the sclerotic shrinking and *closing upon* the retina, which resents at all times all pressure upon its delicate structure, whether in the early stages of congestions of the eye, as in glaucomatous disease, or in the last stages of destructive disorganisation.

One more case will shew the treatment necessary to preserve the eye which is sympathetically affected from an early stage.

In October, 1866, I was consulted by a lady, aged 26, who had suffered from corneitis of the left eye when five years old. She was ill, off and on, for a long time with this eye, which eventually got well, with a dense nebula on the upper and inner position of the cornea, the iris being bound to the cornea. She could only discern light from darkness, and the general outline of large objects; in fact, she had no useful vision in this eye. After some

time, which she does not now remember, the right eye became painful and irritable, and for years afterwards she suffered attacks of inflammation in this eye, until it was completely destroyed and became staphylomatous. This was her condition when I saw her. I extirpated the right eye, and made a large clear iridectomy on the lower portion of the iris of the left eye, removing at the time the lens which was cataractous. Since the operation, the poor girl, with the aid of proper spectacles, can see remarkably well, indeed much better than she remembers to have done before, while a glass eye removes the deformity of the excised right eye.

CASES OF RECOVERY AFTER FRACTURE OF THE SPINE,

By W. H. MANIFOLD, M.R.C.S.,

SURGEON TO THE NORTHERN HOSPITAL.

THE following cases, I think, are of sufficient interest to bring under notice, as they afford further examples of recovery following a lesion which, as a class, we must regard as of a most fatal character. The word "recovery" is used necessarily in a limited sense, for though life has been saved, yet there are effects remaining which cannot be regarded as otherwise than permanent. In the first case, two years have elapsed since the injury, in the second, sixteen months, and in the third, sufficient time to permit of my drawing conclusions favourable to the life of the patient.

Fracture of the spine in the lower dorsal region.—Thomas P., aged 28, a sailor, in July, 1866, whilst at Quebec, fell from the ship's rigging on to the deck, a very considerable distance, alighting on his feet. He was removed to the Marine Hospital, where it was found that his lower extremities were completely paralysed. The urine had to be regularly drawn off, and he had no control over the contents of his rectum. He remained in this condition for three months, when sensation, followed by movement, began very gradually to return. In six months he was able to get out of bed and move about with crutches, dragging his legs, "almost as if they did not belong to him." He remained in the hospital until he was sufficiently recovered to return to England. He was admitted into the Liverpool Northern Hospital on September 2nd, 1867 (fourteen months after the accident). On admission he drags his legs a good deal, but is quite able to get about with the aid of a stick. Sensation is natural everywhere. Has full control

over the rectum, but occasionally has difficulty in passing his urine. The temperature of the limbs was as follows :

Upper extremities, $99\frac{1}{4}$ Fahr.

Lower ,, 78 ,,

there being a difference between the two of $21\frac{1}{4}$ degrees.

On examining the spinal column, the spinous process of the twelfth dorsal vertebra projects very considerably beyond the others, forming a well marked though small "hunch." On the left heel there is an ulcer, caused by a nail at the time of the accident, which has never got well, and for the relief of which he has come into hospital. The ulcer is deep, about the size of a sixpence, with hard callous edges. I removed some of the hard skin about the ulcer, had the legs galvanised, and the temperature raised by artificial heat, a stimulating ointment being applied to the wound. The ulcer took some time in healing, but he eventually left the hospital quite well, as far as the wound was concerned, and improved in general health.

It is interesting to observe the delay that took place in the repair of the injury to the heel, in consequence of the impairment of nerve force in the lower extremities generally. The alteration in temperature was well marked, and suggestive of the treatment that would be calculated to promote due reparative action, which since the injury to the spine had been in abeyance.

Fracture of the spine in the middle dorsal region.—Peter R., aged 41, a sailor, was admitted into the Northern Hospital on April 18th, 1867, suffering from an injury to the back, caused by a fall from aloft, a distance of some fifty or sixty feet. On admission his lower extremities were completely paralysed, the bladder and rectum being also involved. On examining the spine, no displacement could be detected till six weeks after the injury, when a prominence was noticed about the seventh dorsal vertebra. This gradually increased whilst he was in the hospital, until it formed a well marked elevation. For some time the patient remained in a very precarious state; his present condition, August 23rd, 1868, sixteen months after the accident, is as follows :

His general health is very good. The urine is rather offensive,

of acid reaction, and constantly dribbling away. The bladder is apparently small, as, on introducing a catheter, not more than one ounce of urine is removed. Bowels very costive. Sensation and motion absent in the left leg, both very slight in the right. Right leg, a little below the normal temperature, left, very much below. As a rule he eats and sleeps well, and his time is occupied in making various small articles, such as balls, models, etc.

This case is one where life might be prolonged and enjoyed for many years, as far as the spinal injury is concerned, if the patient's circumstances permitted of his obtaining the many luxuries which art has provided, in the way of water beds and other contrivances, for the permanently paralysed.

One or two points of special interest may be noted. 1st.—No spinal deformity appeared until six weeks after the injury. The fracture was probably of a comminuted nature, and coalescence eventually took place by the absorption or protrusion forwards of the separated portions of the body or bodies of the injured vertebræ. The spinal column now appears quite firm, permitting the patient to sit up in bed without support, and move the trunk freely. 2ndly.—The right lower extremity suffered much less than the other. There is a slight degree of both movement and sensation, and a corresponding approach in the temperature of the limb to that of the body generally.

To these cases may be added the following one, which came under the care of my colleague, Mr. Harrison.

A dock labourer, aged 42, was admitted into the hospital in December, 1867, in consequence of injuries sustained by falling down a ship's hold, a distance of some thirty feet. The right arm was completely paralysed, the corresponding leg partially so. There was less movement of the right side of the thorax than the left. Sensation on the right side was generally impaired. There was no priapism, and the patient had full control over the bladder and rectum. There was considerable fulness about the lower cervical region, and the spine of the sixth vertebra was out of the line, and diverted towards the left side. The patient was placed on a hair mattress, with the head level with the trunk, and supported by sandbags so as to prevent movement. The treatment was continued

for a month, when the patient became very restless, and it was quite impossible to continue it as long as it appeared desirable. The paralytic condition of the leg gradually passed away before the patient left the hospital, the arm, however, was very slow in showing signs of amendment. Under the influence of galvanism, friction, etc., its condition improved, until about seven weeks after the injury, when the patient was lost sight of, in consequence of being discharged from the hospital for very disorderly conduct.

From the condition of the spine previously described there is little doubt that fracture, or dislocation, or both, existed, but to such a limited extent as only to partially interfere with the functions of the cord. One side only being involved, the power over the bladder and rectum was not lost.

ON INCISION OF THE CERVIX UTERI,

By THOMAS SKINNER, M.D.,

ONE OF THE OBSTETRIC PHYSICIANS TO THE LIVERPOOL LYING-IN HOSPITAL AND DISPENSARY.

THE operation of incising the cervix uteri is common to the impregnated and to the unimpregnated conditions of the womb. In the impregnated state it is limited to the time of parturition, and is only then employed for the purpose of facilitating unusually retarded labours, consequent upon occlusion of the os uteri, or of a rigid, unyielding state of the *os tincæ*, from cicatrices of ruptured parts, or of parts which have sloughed after previous hard labours, and such like morbid states. In the following remarks I shall limit myself to the operation in its relation to the unimpregnated uterus. And, first, of the operation itself.

A very great deal has been written and said as regards the operation, and, as a natural consequence, considerable difference of opinion has resulted, particularly as regards the *armamentarium* and the *modus operandi*. For my own part, I have no desire to differ from, much less to outshine others in the choice of instruments, and in the mode of operating; still, as I cannot follow all, I must take the course suggested by my own judgment, the result of a somewhat matured experience. In the first place, I shall content myself with enumerating the names of those who have distinguished themselves above others in this country by throwing light, *pro* or *con*, upon the operation, or upon the cases best suited to it. Foremost, we have Sir James Simpson, Bart., the late Dr. Rigby, Mr. Spencer Wells, Dr. Barnes, Dr. Greenhalgh, Dr. Routh, Dr. Savage, Dr. Protheroe Smith, Dr. Priestly, Dr. Marion Sims, Dr. Aveling, Dr. Oldham, Dr. Grailly Hewitt,

Dr. West, Dr. Henry Bennet, Mr. Baker Brown, and Dr. Coghlan.

For all practical purposes the operation admits of being divided into—

1. The minor operation.
2. The major operation.

And, so far as the different modes of procedure are concerned, we may speak of those who operate—

1. From without inwards, and
2. From within outwards.

The *minor* operation consists in the incisive dilatation of the cervical canal and *os tinæ*, whilst the *major* involves the incising of the *os internum* in addition to that of the *os tinæ*.

As regards either operation—they both admit of being performed from within outwards or from without inwards—each mode of procedure having its staunch and determined partisans. So far as I am concerned, when it is possible, and it is almost always possible, operating from within outwards is much to be preferred. The objection has been raised, that where a hysterotome will pass there can be no necessity for incision. The operation, be it remembered, is performed on account of dilatation failing to effect what is wanted, namely, a *permanent* patency of the cervical canal; and, if necessary, it follows that dilatation, so as to admit the passage of the hysterotome, is the primary step in the operation of incision of the cervix uteri. Those who operate from without inwards forget that the same objection which they urge against the hysterotome is equally valid against one of the blades of their scissors and of the ingenious little knife of Dr. Marion Sims. In the long run it comes to something like “six of the one and half a dozen of the other.” It will generally be found, however, that in bad cases, cases really requiring incision, dilatation, in some form or other, is necessary.

Space will not permit, nor would it be profitable, to give a *resumé* of all the various instruments and modes of operating, therefore I shall limit myself to the instruments and mode of operating which I feel confident, with all deference to the distinguished Obste-

tricians who have preceded me, are as good as any and inferior to none.

Steps in the operation.—The primary step in either the major or minor operation is—1.—*Dilatation* may be done by metallic bougies, and by tents of laminaria or sponge. I never have had recourse to anything but silver or german silver probes and bougies. Dr. Marion Sims and others have laid great stress upon the pain, upon the difficulties and dangers attending dilatation of the cervix uteri, by means of metallic dilators. They have spoken and written about inflammation of the uterus and its appendages extending to the peritoneum, terminating sometimes in pelvic abscess and death, as not infrequent results of dilating by means of bougies. If those occurrences have happened, and I do not doubt they may have, they must be very great exceptions to the rule. I have dilated a considerable number of cervical canals, many where it was all but impossible to pass the finest surgeon's probe, and I am not aware that I have ever caused a patient anything like unbearable pain, and what little I have given them was but momentary, possibly a few seconds of a feeling of faintness, sickness, and the like. As to peritonitis, or any form of *itis*, I am glad to say that in my practice it has never followed dilatation of the cervix. If a surgeon's probe can be made to pass, I have never had any difficulty in dilating the cervix so as to allow a No. 12 male urethral bougie to pass, in about a week or a fortnight at most. The great secret in dilating the cervix is, never to attempt too much at one time, and never to attempt it at all if there is sub-acute or chronic metritis, or an irritable supersensitive condition of the cervical canal. The case is then not one of *simple obstructive* dysmenorrhœa, nor is it one of simple sterility from *mechanical* causes, the only two conditions relievable by the operation. As I do not wish to be misunderstood, let me observe that I am not advocating dilatation as preferable to, or safer than, incision of the cervix uteri; but, as dilatation must of necessity frequently be the primary step in the operation of incising the cervix, I am desirous of removing from the operation of dilatation what I believe to be exaggerated evils. Dilatation can never come up to, far less surpass or supersede, the operation of incision of the cervix uteri, for any purpose for

which permanent patency or enlargement of the cervical canal is required.

2. *Hysterotomy*.—Having succeeded in dilating the cervical canal to allow of the easy passage of a hysterotome, place the patient on her back in bed exposed to a good light. [I quite agree with Dr. Marion Sims, that, in all surgical operations where light is available, it ought always to be utilised.] Widen the limbs, and if thought necessary raise the knees, placing the feet on the bed. Introduce a Coxeter's bivalve speculum (one that will allow the hysterotome to pass easily to and fro), and open it,



exposing the *os uteri*. Then introduce the bilateral hysterotome of Dr. Routh,* as manufactured by Coxeter of London, an outline engraving of which is attached to this article. If the *minor* operation is what is wanted, set the instrument at its fullest cutting depth; introduce the intra-uterine portion rather more than half way; hold the sheath and withdraw the handle. This will incise the vaginal portion of the cervix and *os tinæ*. If the *major* operation is wanted, set the instrument to its lowest cutting depth—introduce the intra-uterine portion to its full extent—hold the sheath and withdraw the handle. This will sufficiently freely incise the entire cervical canal. If the parts are hypertrophied, or larger than usual in those who have not borne children, the instrument may be set at its fullest cutting depth before operating. There is one point which in my estimation ought never to be lost sight of, and that is, whatever depth of incision is made, on no account ought the vaginal portion of the cervix to be *divided or split through and through*. In the operation from without inwards—particularly where it is accomplished by means of scissors—this “mutilation” must occur. With the hysterotome

* Of all the hysterotomes which I have seen, and I think I have seen and studied most of them, Dr. Routh's instrument, as made by Coxeter, is, *par excellence*, the hysterotome for which I have a decided preference. I believe that it is founded upon the model of his colleague, Dr. Greenhalgh's hysterotome.

it may also occur, but it need not, and, I repeat, it *ought not* to occur;—because the capillary and venous circulations of the os and cervix are thereby mischievously interfered with, are obstructed by the division, and, as a consequence, there constantly result intractable forms of leucorrhœa, with chronic congestion and induration of the parts. I have had many such conditions to contend with, in cases which have come to me from the north and from the south. I have no hesitation in saying that, for any purpose whatever, *dividing* or *splitting* the cervix laterally is altogether an unnecessary part of the operation of *Incision* of the cervix uteri. The double incision having been accomplished by one stroke of the hysterotome, I introduce a piece of book muslin, about three inches square, on the point of a bougie or uterine sound. By doing so, hæmorrhage is entirely prevented, and the wound is kept from re-uniting. I renew this dressing every day for a week or so, and after the first few days I steep the muslin in an aqueous solution of carbolic and acetic acids. Before withdrawing the speculum after the first dressing, I fill it with loose cotton wool, and push it into the vagina as the speculum is being removed, by way of an additional preventive of hæmorrhage.*

After treatment.—The patient is to remain in bed until she is able to go about again, that is, as soon as the parts are healed, which is generally in about a week. About the end of this time, if there is no contra-indication, I pass a large sized uterine bougie daily, or every second day, for a week or fortnight, in order to prevent contraction of the cicatrising surfaces; and it is sometimes advisable to repeat this once a week in the interval between the first menstrual period and the next.

I have no hesitation in stating, that where the operation is performed as I have directed, and where the cases are properly selected, as well as the time for operating, namely, a few days after a menstrual period, I believe there is no danger from

* Many operators advise the introduction of sponge and other tents of *expansible* material; but they are objectionable, as their use is not without danger. I equally object to the use of all metallic or hard substances, in particular, intra-uterine spring tents and the like. They may be ingenious, but they are unsurgical, and much inferior to the muslin plug.

hæmorrhage, inflammation, or from a recurrence of the evil, more than may follow from the simple operation for fistula in ano. The not unusual practice of operating in consulting rooms cannot be too strongly condemned, as it brings the operation into unmerited disrepute, and is injurious to the patient by the hæmorrhages and inflammations which may, and which do take place in consequence.

Some operators, by way of keeping the parts from re-uniting are in the habit of touching the cut surfaces of the wound with nitrate of silver, or the like. I can only say that, as I have seen this practice followed by excruciating pain in very many instances, I cannot recommend it; and I have very little doubt that it is frequently followed by more than one form of "*itis*." The muslin plug is quite as effectual, is attended with no pain, and on the whole is a much more humane and surgical proceeding.

Uses of the operation.—The uses of the operation are said to be threefold. 1. To relieve or cure obstructive or mechanical dysmenorrhœa. 2. As a cure for sterility depending on mechanical or spasmodic stricture of one or more portions of the cervical canal. And 3. To remove certain displacements of the uterus, particularly retroversions and flexions of the organ, by increasing the chances of conception or impregnation.

As regards *the first* of these uses, I have always been sceptical. I have known the operation performed by the best operators, and with very indifferent success. Sometimes, if not always, the effect is but temporary; and I feel tolerably sure that even the temporary effect produced is much more likely to be the result of loss of blood at the time of the operation, or following it, than of the incisive dilatation of the uterine canal. I am the more inclined to be of this opinion, because I have had many of the worst forms of dysmenorrhœa under my care, cases which have been diagnosed, by the most distinguished incisers and dividers of the cervix, as obstructive, and cases which have been operated upon, some without the slightest benefit, and others with only temporary relief, and I have rarely failed to make a permanent cure of such cases by medical and hygienic means. One case of the kind was sent me by my friend, Dr. Turnbull, now of Exmouth,

and the words of his letter of introduction were, that he would "consider it a great triumph of professional skill if I succeeded in effecting a cure, after what had already been done."

This patient, who was suffering under the worst and most intense form of dysmenorrhœa I ever read of or witnessed; who, once in every month, *for years, writhed in agony*, each period ending with an entire day of coma and epileptic fits, arising from exhaustion following four days of excessive pain; and who was operated upon for mechanical or obstructive dysmenorrhœa without relief—was cured by medicine alone in the "Invalid Home" here, in the short space of six weeks. Judging from this and many other cases, I have long been of opinion that, as a means of relief or cure in dysmenorrhœa, incision of the cervix uteri ought to occupy no higher position than that of a *dernier ressort*.

In further elucidation of this part of my subject, let me just point to an observation which may be verified almost any day in private or hospital practice. Very frequently we find, when we would least expect it, the cervical canal and *os tinæ* small and contracted, and no pain whatever may be complained of during healthy menstruation; and we also as frequently find the same parts very patent, and accompanied with great pain during the catamenial period. The obstruction in *purely mechanical* dysmenorrhœa is not, in my opinion, referable so much to the narrowness of the canal of transit or exit, as it is to the consistency, the plasticity or liquidity of the fluids and solids to be transmitted. The pain accompanying the obstruction doubtless arises from mechanical incompatibility between the secretion and the canal of exit, *but this same incompatibility obtains where no stricture whatever exists*.

As regards *the second* of its uses, I have no hesitation in advocating and supporting incision of the cervix, both as regards its legitimacy and as regards its positive value. In sterility depending upon stricture, I am as certain that the obstruction is at the *os tinæ* and vaginal portion of the cervix uteri, as I am that in mechanical dysmenorrhœa the obstruction is at the *os internum*. In the latter case, however, as I have already said, the obstruction

is rarely caused by stricture, unless spasmodic (of the *os inter-*
num : it is almost always caused by a plug of inspissated mucus,
 by the remains of a previous over active secretion (*Rigby*), by
 a clot or clots of blood, or from membranous or gelatinous
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 there is generally more or less elongation of the vaginal portion
 of the cervix, a tapering of it, and a small, perhaps pouting
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 is necessary: but, to prevent disappointment, the *major* had
 better be had recourse to.

I here beg to repeat, that *splitting up the vaginal portion*, and
 so “*mutilating*” it, is not necessarily a part of the operation of
 incision of the cervix for the cure of sterility, no more than it is
 for the cure of dysmenorrhœa.

The following case made so great an impression on my mind at
 the time, is otherwise so instructive, and, as it bears me out in the
 opinions I have formed and in the practice which I follow, I here
 transcribe it. In 1856, I asked Sir James Simpson to operate
 upon an artisan's wife, who attended his afternoon *clinique*,
 and who was very anxious to have a child. The *os tinca*
 was small, the cervix elongated, and the canal curved, so as
 to make it impossible for either Sir James or myself to *pass*
 any instrument above one and a-half inches. The body of the
 uterus was natural, no way displaced—the woman was nine
 months married and perfectly regular. Sir James introduced his
 hysterotome as far as it would go, divided the parts in the usual
 way, and the result was, that, in *three weeks from the day of*
operation, all the symptoms of pregnancy set in, and she bore a
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As regards the third use of the operation, that of rectifying
displacements of the uterus by increasing the chances of concep-
 tion, and thus obtaining a cure of the version or flexion by the
operation of the uterus during pregnancy, I must confess to being
 indeed. It is in accordance with my experience

that retroflexion always returns after parturition, do what we can to prevent it. If it does not return, then, verily, it is more good luck than good guidance. With retroversion there is a better chance. It is in my experience also that displacements of the womb *per se* are no great hindrance to conception; but if a case of displaced uterus presented itself where the woman was small and the individual had been some time married and had never conceived or borne a child, then I should advise the whole operation in favour of conception, but I should not look for the removal of the displacement. If it should disappear, good and well; but I repeat it is not to be looked for. So that after all, it comes to be only a cure for sterility with displacement. I had a case sent me from London lately, where the cervix was not only tilted, but it had been cured of retroflexion by favoring impregnation. No good followed, but, on the contrary, the poor creature has suffered ever since from chronic metritis and from the horrible form of leucorrhoea I have previously alluded to, which it will take months to remove. I repeat, that I have good reason to be very sceptical about this third use of the operation. I am not convinced altogether, however, but leave it as open question. It is so possible that a case might turn up where it would be advisable to cure a displaced uterus.

Dangers and objections.—I have frequently been asked by fellows in practice if I thought there was danger or risk to the health in connection with the operation. I have no hesitation saying that there is risk from haemorrhage, from metritis, pyelitis, and every form of pelvic cellulitis and though last, not least, toxæmia. I have frequently seen all of these conditions in the last. I have only heard of the latter termination;—but I think they have ever occurred in my practice. I am aware that of bad consequences in my own practice is rare in the case of cases, to choosing the proper time for operating, the manner of operating which I adopt, and in the general condition during the after treatment. In the selection of cases, I avoid anæmic, dissipated, debilitated subjects, as also gouty, rheumatic, and leucorrhœal subjects, these and other like conditions have been associated

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that retroflexion always returns after parturition, do what we like to prevent it. If it does not return, then, verily, it is more by good luck than good guidance. With retroversion there is a better chance. It is in my experience also that displacements of the womb *per se* are no great hindrance to conception; but if a case of displaced uterus presented itself where the *os tincae* was small, and the individual had been some time married and had never conceived or borne a child, then I should advise the *minor* operation, to favour conception, but I should not look for the removal of the displacement. If it should disappear, good and well; but, I repeat, it is not to be looked for. So that, after all, it comes to be only a cure for sterility with displacement. I had a case sent me from London lately, where the cervix was not only *incised*, but *divided*, for the cure of retroflexion by favouring impregnation. No good has followed, but, on the contrary, the poor creature has suffered ever since from chronic metritis and from the intractable form of leucorrhœa I have previously alluded to, which it will take months to remove. I repeat, that I have good reason to be very sceptical about this third use of the operation. I shall not condemn it altogether, however, but leave it an open question. It is just possible that a case might turn up where it would be advisable so to cure a displaced uterus.

Dangers and objections.—I have frequently been asked by my fellows in practice if I thought there was danger or risk to life or health in connection with the operation. I have no hesitation in saying that there is risk from hæmorrhage, from metritis, peritonitis, and every form of pelvic cellulitis, and, though last, not least, toxæmia. I have frequently seen all of these accidents but the last. I have only heard of the latter termination;—but none of them have ever occurred in my practice. I attribute the absence of bad consequences in my own practice to care in the selection of cases, to choosing the proper time for operating, to the manner of operating which I adopt, and to the great care taken during the after treatment. In the selection of cases, above all things I avoid anæmic, dissipated, debilitated and emaciated subjects, as also gouty, rheumatic, and neuralgic habits. When these and other like conditions have been removed, there will

then as a rule be little necessity for the operation, except for the cure of sterility depending upon occlusion or stricture of the *os tincae*, with or without flexion or curvature of the cervical canal, the chief legitimate uses of the operation of incision (not division) of the cervix uteri.

ACUTE TUBERCULAR PERITONITIS, SIMULATING MALIGNANT ABDOMINAL TUMOUR,

By I. DE ZOUCHE, M.D.,

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ANNE J., aged 38, was admitted into the Liverpool Workhouse Hospital on the 10th August, 1867. She stated that she had always enjoyed good health until a month before her admission, when she noticed a swelling in the abdomen, which rapidly increased. She suffered no pain or inconvenience, further than slight discomfort from the size of the abdomen, until a few days previous to her coming into hospital, when her breathing began to be somewhat difficult, and she found herself unable to lie down in bed. On admission, the abdomen measured 45 inches in circumference. There was no œdema of the feet. The heart and lungs were healthy. There was no apparent alteration in the size of the liver or spleen. The face was pale, and, while far from wearing the expression of health, gave no indication of the amount of mischief going on in the abdomen. The digestive powers were good, and the bowels regular. The menstrual secretion had been regular until the *last* period, when it did not appear. The abdomen was equally distended throughout, and fluctuation of fluid, apparently in the peritoneal cavity, was easily perceived. There was dulness on percussion over the whole of the abdomen, except in the right lumbar region, in a very limited space. Nothing could at this time be ascertained by palpation, the fluid intervening at every part except the spot above indicated. The urine was diminished in quantity, cloudy, faintly acid, sp. gr. 1022, containing no albumen. A few crystals of triple phosphate were seen under the microscope, but no other peculiar appearance. The cause of the ascites was the more obscure as there was no

family history of disease to guide in its determination. About the 18th August, she commenced to vomit her food. This vomiting it was found impossible to check. She took food readily, even eagerly, although quite aware that she could not retain it. Quantities of yellowish muco-bilious matter were also frequently vomited. A great many remedies were tried to arrest this condition, but in vain. She suffered greatly from thirst. I remarked that the quantity of fluid vomited was much greater than that taken by the mouth. At the same time, the size of the abdomen decreased rapidly, and the outlines of what appeared to be a tumour could be felt. It appeared to consist of three parts, giving the idea of a semisolid multilocular tumour, the largest portion occupying the left iliac and lumbar regions. There was much pain complained of on pressure being made over this situation. Shortly before death, the circumference of the abdomen was a little less than the normal measurement, and fluctuation was scarcely perceptible. The bowels were inclined to be constipated, but were acted on from time to time by aperients and enemata. Three days before death there was a natural evacuation. The patient became much emaciated and depressed from want of food and sleep. She dozed under the influence of opiates, subcutaneously injected, but was frequently awakened by the necessity of vomiting. She died on the 3rd September.

Examination of the body thirty-six hours after death. There was evidence of recent pleuritis at the lower and posterior part of the chest, with serous and bloody effusion into the pleural cavities. The heart was healthy, but displaced upwards, and toward the mesial line. On opening the abdomen, what at first sight appeared to be a tumor came into view, occupying a great part of its cavity. It was found to consist of the omentum perfectly infiltrated with tuberculous matter, and thickened to the extent of half an inch. The stomach and intestines were matted together by this tuberculous mass, and were themselves studded with tubercle, which, however, was deposited on their peritoneal coats, but did not extend to their interior. The tuberculous inflammation appeared to have been most intense and recent in the left iliac region, where pain on pressure had been complained of. There was no tubercle in

the lungs. The liver was slightly fatty, the spleen and kidneys healthy. A small quantity of fluid was found in the peritoneal cavity.

This case has many points of interest; first as to the diagnosis. This was surrounded with difficulties. It was believed that a malignant tumour existed, but its precise nature or position remained undetermined. The lobulated and uneven feel of the intestinal mass, covered by the thickened omentum, giving a dull sound on percussion over the umbilical and hypogastric regions, and, taken in connection with the ascites, seemed to indicate the existence of an ovarian tumour. The age and appearance of the patient, and the suppression of the menstrual secretion at the last "period," would confirm this belief, and the vomiting might be accounted for as the result of reflex irritation. Against this supposition were the facts that the os uteri appeared healthy and in its normal position, and that affections of the ovary seldom run such an acute course. Although tuberculous inflammations are not usually classed among the malignant affections, yet this had all the symptoms of malignancy in rapidity of course and exhaustion of the patient.

Another interesting phenomenon was the absorption of the ascitic fluid by the abdominal vessels, and its being emptied out by the stomach. This absorption must have taken place constantly, as the vomiting had no relation in point of time to the taking of food. It appeared as if it required a certain quantity of fluid to excite the stomach, which rejected it as soon as it had accumulated.

ON MEDICAL OPHTHALMOSCOPY,
IN ESPECIAL RELATION TO CASES OF PROGRESSIVE
GENERAL PARALYSIS,

BY T. R. GLYNN, M.B. LOND.,

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AT THE SCHOOL OF MEDICINE.

THE ophthalmoscope seems to have been discovered some years before any one imagined that it might give information other than such as could be valuable to the ophthalmic surgeon, or thought of using it in the investigation of diseases of the brain or spinal cord.

If fewer difficulties had attended the application of this instrument, it is probable that the physician would have at once looked upon it as a valuable clinical aid, or at least would have been more eager to give it a fuller trial.

Physicians, in investigating some cases of intracranial disease, have endeavoured to gain some information as to the state of the cerebral circulation by applying the stethoscope over the cranial sinuses; now, however, that they have the ophthalmoscope to assist them, they have no occasion to resort to expedients so nearly fruitless.

The wonderful sympathies that exist between the intracranial and intraocular circulation, and between the nutrition of certain parts of the brain and cord and that of the optic disk, are in many cases calculated to help those who study diseases of the cerebrospinal centres with the mirror in their hands.

Professor A. Von. Graefe seems to have been one of the first who took a wider view of the revelations of the ophthalmoscope.

He, in the year 1860, communicated to the Biological Society of Paris the result of his investigations "concerning certain changes of the retina and optic disk, observed in connection with different cerebral affections."

In the same year, Dr. Ogle also published some observations "on the use of the ophthalmoscope as a help to diagnosis in diseases of the nervous system."

These observers were soon followed by others. MM. Liebreich, Buchut, Lancreaux and Galezowski abroad, and Drs. Albut, Hughlings Jackson, and others at home.

Physicians now seem to take much more interest in the revelations of the ophthalmoscope. The papers on medical ophthalmoscopy that appear from time to time in this country, and on the continent, contain much that is worthy of the attention of the pathologist and medical practitioner.

Not only have changes in the depths of the eye been discovered, which are symptomatic of various cerebral and spinal affections, such as meningitis, encephalitis, hydrocephalus, intracranial tumours, and locomotor ataxy, but others peculiar to more general disorders, as Bright's disease, diabetes, and ague, have been noted.

It is not surprising that psychological physicians should have early essayed to examine the retina of their patients. Dr. Coccius of Leipsic was the first who thus used the ophthalmoscope (*Archives Générales de Médecine*, September, 1866).

Dr. G. Ludwig also examined the eyes of a great number of insane persons. He seems to have only found a passing fulness of the vessels of the retina and disk in one or two instances. In one case he states that he could predict the onset of a paroxysm of mania, by the capillary injection of the disk which preceded it (*Allgemeine Zeitschrift für Psychiatrie*, xiii. i. 1856).

Dr. H. Wendt examined the eyes of 150 of the patients at the *Asile de Halles*. "Unfortunately, however, his attempt was attended by little success. Several times he found slight irregularities of the borders of the optic disk. On another occasion, part of the edge of the papilla was clearly defined by a line of pigment.

He observed partial excavations of the disk thirteen times in one eye and twenty-nine times in both.

In one patient he discovered a fulness of the retinal veins. In about thirty instances he found a sclero-choroiditis" (*Buchut du Diagnostic des Maladies du Système Nerveux*).

"Dr. Gualiero, professor of ophthalmology at Pavia, examined many monomaniacs and others suffering from the more tranquil forms of insanity, and discovered in fifteen cases great dilatation of the veins of the retina" (*Buchut*). Buchut records a singular and instructive case which occurred in the practice of Dr. Baumler of Erlangen.

A man, fifty years of age, was suffering from suicidal mania. An ophthalmoscopic examination of his eyes was made. In one eye there was a small apoplexy of the retina, together with an atheromatous degeneration of some of the arteries; one of these vessels was quite white throughout its length. On the man's death, by suicide, softening of the brain was revealed.

M. Liebreich has endeavoured to prove that there is "a predisposition to retinitis pigmentosa, in the cases of idiots, and especially of deaf mutes who are the children of consanguineous parents."

"Out of 341 deaf mutes at Berlin, 241 were examined by the ophthalmoscope. There was pigmentation of the retina in 14; a considerable number, since, according to the researches of Liebreich, there are probably only from 20 to 30 persons suffering from this disease in the whole town. Out of these 14 deaf mutes, 8 were Jews; now we know that consanguineous marriages are frequent among the Jews. In 5 cases out of the 14 the parents were found to be related to each other; in 7 they were not; in 2 information was wanting. In the asylum for the deaf and dumb at Paris, Liebreich found 7 cases of retinitis pigmentosa, 3 of these were the children of parents who were consanguineous" (*Fano Traité Pratique des Maladies des Yeux*, tome 2, p. 459).

These observations do not appear to have been confirmed by subsequent observers. M. Duguet examined 80 idiots at the Salpêtrière, but found only pigmentation of the retina in one case.

Observers have long sought for some lesions in the fundus of

the eye, characteristic of progressive general paralysis. Buchut remarks, "General paralysis, with or without mental alienation, exerts often an evil influence upon the visual function, in such a way as to disorder either the movements or the nutrition of the eye."

"Though not actually characteristic of the disorder, these lesions may aid diagnosis considerably, and merit careful study. They are:—nystagmus, this lesion is rare but has been observed by several authors; strabismus and diplopia, they exist often at the commencement of general paralysis and a long time before the appearance of other symptoms of paralysis or insanity; amaurosis, this is stated to be quite exceptional by Georget, Parchappe, Billod, &c., but I have observed one example of it; inequality of the pupils observed by Baillarger, Lasègue, Billod, in one-third of their cases; and lastly, that lesion which I call *ataxy papillaire*, or trembling of the papilla." Buchut then goes on to state, that he has observed this symptom in many patients under his care. When it exists these are its characters: "there is an abnormal and irregular mobility of the eyes, so that they are carried sometimes in one direction and sometimes in another, not being quite under the control of the will. To fix the eye is impossible, or almost so. There is in the muscles a hesitation in action which resembles the trembling of the tongue." Buchut finally alludes to atrophy of the disk, but says that it is rare. He records two cases in which he observed it. M. Calmeil examined 56 cases of general paralysis. He found in 3 complete amaurosis. In a few only, impairment of sight, sometimes of one eye, sometimes of another, and sometimes of both. "Usually the weakness of sight occurred during the last stage of the disease."

Galezowski examined many patients at the Salpêtrière suffering from general paralysis. When the sight was affected or lost, he invariably found progressive atrophy of the papilla. Other observers, too, have occasionally discovered the same affection.

Defect of vision and alterations in the fundus are far from being of frequent occurrence during the progress of general paralysis, yet the pathological changes of the brain in this disease are very extensive and constant.

M. Linas opened 114 bodies of paralytic insane, and in every case he found decided signs of disease, in the brain or its membranes. "In 12 cases he found the pia mater excessively injected. The cerebral substance was quite full of blood, the grey matter being from an intense red to a dark violet. In 28 cases, besides the preceding alterations, there were adhesions between the convolutions and the meninges. In 74 cases, the meninges were infiltrated, opaque, and as tough as a fibrous membrane, the cortical substance of the brain, sometimes violet, sometimes yellowish, according to the degree of the paralysis, always softened, less thick than in normal brains; the white substance injected, and sometimes infiltrated; the convolutions meagre, and the whole mass of the brain more or less atrophied."

According to Griesinger. "The changes most frequently observed in general paralysis are great œdema of the membranes, adhesion of the pia mater to the cerebral surface, greyish red softening, or coloration, and partial superficial induration of the cortical substance, with increase of connective tissue and destruction of the nervous elements."

"Atrophy of the whole brain, or especially of the convolutions, is very common."

"An increase of cellular tissue, and development of true connective tissue, occurs frequently in the white substance, either generally diffused or limited to certain portions. Pachymeningitic processes, meningeal apoplexy, degeneration of the cerebral arteries, are common."

"The anatomical changes are not always identical, but constantly present certain varieties; this appears to depend upon the fact, that in some cases one, and in other cases another, element of the disease is the most prominent (it may be meningitis, or atrophy of the entire brain, or sclerosis of the cortical substance); and this may depend upon the more rapid or more acute course of the disease."

How is it that we have not more constant and characteristic lesions in the fundus of the eye in cases of general paralysis?

Before pursuing this question further, we had better consider

under what circumstances, and in what diseases, we find the most decided morbid appearances in the eye. There is one important anatomical fact, which is at the foundation of much of the pathology of the affections of the disk and retina.

In the fundus of the eye we see two distinct systems of vessels, one the central artery and vein of the retina, and the other the small vessels which give the rose colour to the disk. It was Galezowski who first directed attention to this fact (*Etude Ophthalmoscopique sur les Alterations du Nerf Optique*).

The central artery is a branch of the ophthalmic artery. The central vein terminates in the ophthalmic vein, and so pours its blood into the cavernous sinus. The optic nerve, of which the disk may be considered the peripheral termination, is supplied by several arterial branches, namely, a branch from the middle cerebral artery to the optic tract. One or two small vessels from the choroid plexus which also enter the optic tract; some small branches from the pia mater to the chiasma. There is also a special artery to the corpora quadregemina (*testes*). Besides this the pia mater invests the optic tract as it does the brain. Thus, as Galezowski observes, "these capillary branches form a vascular network from the optic tracts to the papilla of the optic nerve."

This independence of the retinal and papillary circulation is verified by pathological observation, and in no instance more strikingly than in embolism of the central artery of the retina. In such cases, while the central vessels are bloodless, or nearly so, the papilla is of its natural hue, at all events till it becomes secondarily implicated. Many examples of this affection have been recorded. Dr. Fano (Observation cclxiv.) relates a well marked instance of it.

If there be any impediment to the free circulation of the blood in the cavernous sinus, there will necessarily be a stagnation of the blood in the central retinal vein. The branches of this vein may then become distended, tortuous, or varicose; if the obstruction be great, blood may be effused on the retina. The papilla cannot escape if there be much distention, for, as Graefe and Dr. Albut have shown, the central vein then exerts a baneful

eccentric pressure on its nervous elements and vessels as they are surrounded by the unyielding sclerotic ring, a state of strangulation is thus produced, and this Dr. Albut calls ischæmia of the disk.

Inflammation of the meninges at the base of the brain, if it implicates the walls of the cavernous sinus, causing deposition of lymph in its interior, and consequently impeding the circulation, may thus give rise to these conditions. The same lesions may also be produced by the direct pressure of an intra-cranial tumour, etc., etc.

A meningitis, if in the neighbourhood of the optic nerves, may excite in them an inflammation from an extension inwards of the morbid action, and this may pass down the nerve to the papilla, constituting what is called a descending neuritis.

The inflammation around a clot, if in the vicinity of the optic nerves, may also readily excite a neuritis, or the pressure of a tumour may do the same.

It is the site of the intra-cranial lesion which determines to a great extent the position and character of that in the back of the eye. If an obstacle to the return of the venous blood from the eye be produced in either of the ways before mentioned, a dilatation of the central vein and its branches is the first step of the morbid process. The disk, if implicated, becomes so secondarily.

If an inflammation be excited in any part of the optic nerve, an optic neuritis will be probably produced; and here necessarily the morbid action in the fundus commences in the papilla. The inflammatory swelling of the papilla may impede the circulation in the retinal vessels, so that they, in their turn, may be secondarily affected.

Diseases of the spinal cord, such as chronic myelitis, especially when occurring in the dorsal region, and locomotor ataxy are not infrequently attended with hyperæmia and atrophy of the optic disks. Some observers, as Buchut, believe that the disease of the cord may influence the state of the vessels in the back of the eye, through the communication that exists between the anterior roots of the two first dorsal pairs and the sympathetic;

others, as Galezowski, think that the sympathetic affection of the disk depends on the intimate connection that exists between the posterior and antero-lateral columns of the cord, and the corpora quadragemina.

Writers on cerebral ophthalmoscopy often make mention of atrophy of the disk. Two distinct kinds of atrophy are recognised: one is the result of impaired nutrition of the optic disk, brought about by a neuritis or an ischæmia; the other arises from a starving of the papilla from the gradual dwindling of the vessels of the optic nerve. The former variety is far the most common. The ophthalmoscopic appearances of both are characteristic.

In consecutive atrophy, there are traces of past morbid action in the disk. It is not as white so it is in primary atrophy, but looks stained and patchy. Its borders are irregular and concealed in places by old exudation.

In progressive or primary atrophy, the disk is of a glistening, pearly whiteness. It is regular in form, and its borders are clearly defined.

We will now return to the question; How is it that defect of sight, and alterations of the papilla and retina, are not more frequent attendants on general paralysis? If the cerebral lesion is not in the neighbourhood of the optic centres, or nerves, or near the cavernous sinus, it is improbable that they can become in any way implicated, and, therefore, that the nutrition of the retina and disk can be influenced. There are no visible alterations in the fundus in simple inflammation of the membranes on the superior surface of the brain, but in meningitis at the base they are very frequent. Thus, changes in the back of the eye seldom occur in the meningitis that may ensue during an attack of acute rheumatism, or of scarlet or other fevers; but they are very common in tubercular meningitis. When, as in some cases of general paralysis, and in many cases of chronic insanity, the diseased action is limited to the cortical substance of the upper part of the cerebrum, and the adjoining pia mater, we should not expect to find anything abnormal by the ophthalmoscope. When, however, the medullary substance is greatly involved, as it often

is in other cases, it appears strange that no signs of cerebral disease should be apparent in the eye.

This exemption from disease is probably explained by the geographical position of the optic centres and nerves, and by their independent vascularisation.

When in cases of general paralysis any lesion is apparent in the fundus, it is said usually to be a primary atrophy of the disk, may there not sometimes be a chronic inflammation of the disk of a similar character to that of the brain, produced by a descent of the morbid changes?

It must be remembered that there is in each cerebral hemisphere a fan-shaped expansion from the optic tracts to the posterior lobes. Now, as disease is sometimes traced as far as the spinal cord, may it not occasionally descend to the optic nerves through these continuous fibres?

Is it not probable that we should occasionally find a primary atrophy of the disk in those cases where there is atrophy of the brain attended with sclerosis, and general disease of the cerebral arteries?

Through the kindness of Dr. Rogers, the Physician to the Rainhill County Asylum, Dr. Roberts and I were, in the month of July last, permitted to examine the eyes of such of the patients in the Institution as we desired. We are very much obliged to Dr. Rogers for the opportunity afforded to us, as well as for his valuable co-operation. We have to thank Mr. Stocks and Dr. Barker, the Assistant Medical Officers to the Asylum, for their kindness in supplying the notes on the cases.

There are about 500 patients in the asylum, and among these a great number of cases of general paralysis. We, however, could find no instances of amaurosis, and very few of decided impairment of vision.

The two most marked cases of defective sight were caused by affections of the eye, probably quite independent of the cerebral disease. One was a case of cataract, and the other of opacity of the cornea.

In several instances we found on using test types, that the acuteness of vision was to some extent impaired.

In some cases of general paralysis, where we used the ophthalmoscope, we experienced some difficulty in examining the disk, from an inability of the patients to maintain their eyes long in one position. This is the symptom that Buchut calls "trembling of the papilla." One or twice we found an inequality of the pupils.

We first examined the eyes of eight cases of progressive general paralysis, of various degrees of intensity. In all cases, the pupils were dilated by atropine. There were some marked peculiarities in the eyes of three of these cases.

George V., aged 46, admitted June, 1868. Note on admission—"Progressive general paralysis, with general failing of his mental faculties, no delirium—muscular system very low, soft and flabby."

5 Type Jäger is the smallest he can read.

Ophthalmoscopic appearances:—

Left eye.—Retina natural; margin of disk well defined, but decidedly irregular, a little pigment on outer side; colour natural. Central vessels natural.

Right eye.—Margin of disk also irregular.

William H., aged 46, admitted May, 1867. Note on admission—"Progressive general paralysis with dementia. Muscular development good."

While in the asylum has had several short attacks of paralysis, each of which has left him more helpless in mind and body.

5 Type Jäger is the smallest he can read.

Right eye.—Disk, appears swollen, much more red than natural. Margin ill defined and cloudy. Central veins enlarged and rather tortuous, arteries natural.

Left eye.—Ditto, but not so well marked.

Garret S., aged 25, admitted August, 1867. Note on admission—"General paralysis with dementia. Has been laid up six months. Bodily condition good superficially. Is very nervous, and excessively depressed. No delusions. Complains of his head. Cannot articulate or speak plainly."

During his residence in the asylum has become very much weaker, both in mind and body. Muscular system not so well nourished. Has paroxysms of excitement.

Unable to test the sight, as can get no satisfactory answer from him.

Left eye.—Disk ill defined on its inner side, where it also appears congested. Central arteries and veins natural.

Right eye.—Natural.

I have not included the following case with the above, as an example of a change in the eye symptomatic of disease of the brain, as the affection of the eye was probably purely local.

Henry P., aged 43, admitted March, 1867. Note on admission—"General paralysis. Melancholia. Muscular system soft and flabby. Has several delusions."

During his stay in the asylum, has improved both in mind and body. Muscular system much healthier and firmer. Has no delusions now. "Believes his short-sightedness came on from over-work at his watchmaking trade."

He has a partial opacity of the cornea of the right eye, with a cataractous lens.

He says that he underwent an operation before his admission. What the nature of the operation was is not clear.

There was commencing cataract of the lens of the left eye.

The tension of the eye-balls seemed normal. The disk in the left eye appeared more red than natural, and was ill defined. Veins very full. Arteries healthy.

I scarcely know whether we ought to consider the irregular outline which the disks presented in the case of George V., an individual peculiarity or a pathological sign.

The centre of the papilla was slightly depressed, but only normally so, and was of its natural white colour. The border presented the usual half tones of red and white.

This condition certainly had not been preceded by any neuritis; it was not a commencing "consecutive atrophy;" there was no blurring nor staining of the disk, nor no exudation about its borders. Neither was the change in the disk such as we should find in a primary atrophy, for then the disk maintains its normal form and outline, but gradually whitens from its periphery inwards.

The man could only read 5 Jäger, but this diminution of the acuteness of vision might have been due to some error of refraction.

On the other hand, however, we might not be wrong if we regarded this alteration in the contour of the papilla, and this impairment of vision, as signs of commencing chronic inflammation of the optic nerves (what Albut would call chronic neuritis), attended with a sclerosis of the intercellular tissue, and very little vascular action. Repeated observation alone will enable us to form a correct opinion.

On examining William H., we discovered a somewhat intense congestion of both disks, especially of that of the right eye. An interesting proof of the swelling of the disk deserves to be noticed. It was easy to see that the veins as they crossed the disk were pressed upon, for on its face they appeared smaller and lighter in colour, but just beyond its border they seemed to be dilated and tortuous. There can be little doubt, I think, that this hyperæmia of the disk was not a passive congestion, due to a stasis of the venous blood from some impediment to the circulation in the cavernous sinus. That it was not the commencement of what Dr. Albut calls an ischæmia of the disk. Though the retinal veins were dilated they did not appear enlarged to such a degree as to exert any mischievous eccentric pressure on the disk.

The congestion was then probably active. If so, was it the forerunner of an acute inflammation of the optic nerve? It might have been, but it is unlikely. It is more probable that it was the commencement of some more chronic inflammation.

In the patient, Garret S., there was a marked congestion of the inner side of the optic disk of the left eye. Perhaps this was an earlier stage of a pathological condition, similar to that existing in the case of William H.

The following are the cases in which the ophthalmoscope revealed nothing abnormal.

Mary P., aged 31. Progressive general paralysis and dementia. Muscular condition fair; mind feeble. Has a tendency to clip her words when speaking, but neither is her tongue, nor are the muscles about her mouth, tremulous. Reads all the type easily.

Both disks are somewhat anæmic, and there is a little pigment around one border.

Margaret H., aged 36. General paralysis. Has been ill about two years. Note on admission—"She is very incoherent, and has many delusions. She staggers in walking. Clips her words when speaking. Has a tremulous tongue. Nutritive condition good." Since admission has become much more feeble. She has had one or two exacerbations. Reads all type easily. Fundus healthy in both eyes.

James B., aged 42. General paralysis. Ill two and a half years. Has various delusions about his property and wealth. Appears tolerably robust. Since his admission he has had several exacerbations. Muscular condition much weakened. 7 Type Jäger is the smallest he can read, but there are superficial opacities of both corneæ. Fundus of both eyes healthy.

James M., aged 31, admitted June, 1868. General paralysis and dementia. Has been ill some time. His mind is very defective. No particular delusions. Good muscular condition, superficially. Has continued much in the same state since his admission, both as regards his mental and physical condition. He says that 13 type, Jäger, is the smallest he can read. Fundus of both eyes natural. It was strange that the acuteness of vision should be so impaired in this instance, but the man may have deceived us as to his powers of sight.

Thus we were quite unable to find any examples of atrophy of the disk.

I think we are justified in believing that in those cases where morbid changes were apparent in the disk, there was very general disease of the brain, that it was descending to the base of the brain, and that the white substance was very deeply implicated.

We then examined several epileptics, and one or two cases of mania.

The two following cases of epilepsy were the only ones in which we observed anything at all abnormal.

William T., aged 50, admitted in 1861. General condition good. He has an epileptic fit about every three weeks. He is incoherent for a long time after a fit, and runs about in an excited

manner. His mind is gradually becoming weaker. 11 Type is the smallest he can read. Both disks are more red than natural, and their margins are ill defined. Central veins somewhat full.

Elizabeth W., aged 41. She has had fits for two years and a half; there is an interval of about a month between each. Her mind is feeble. She has complained of imperfect vision for more than two years.

She reads all but 1 type.

Left eye.—Disk very much more red than natural. A little pigment on its inner side, and also scattered over the retina. Central veins distended.

Right eye.—Disk the same as in the left eye. The veins, if anything, fuller.

One of the patients we examined, who was suffering from mania, had a partial ptosis of one eyelid. There was nothing abnormal in either fundus.

During a paroxysm of epilepsy, there is no doubt great congestion of the brain and retina.

Buchut observes, "After an attack of epilepsy, there is always some dilatation of the retinal veins, which gradually diminishes."

"In epilepsy we often find atrophy of the choroid, retinitis pigmentosa, maceration of pigment, and exudations and hæmorrhages upon the retina, which evidently depend on this disease."

"In the interval of the attacks of essential epilepsy, there is no alteration of the disk, nor of the retinal vessels."

"In symptomatic epilepsies, we nearly always find, on using the ophthalmoscope, serous infiltration and atrophy of the papilla."

Why this condition of the papilla should exist so frequently in cases of symptomatic epilepsy is not at all apparent.

If the epilepsy be symptomatic of some lesion at the base of the brain, and near the optic centres or nerves, we should certainly expect to find some marked affection, a neuritis, for instance, of one or both disks.

There can be no doubt that the ophthalmoscope may at times afford valuable aid to the physician in determining the existence of cerebral disease, as well as assist him in judging of the position of

an intracranial lesion. Its greatest merit, however, undoubtedly is this, that it enables him to follow the steps of certain morbid processes occurring in nervous tissues. It has given to the following oft-quoted words of Dr. Latham a far wider application.

“Here you see almost all diseases in miniature: and, from the peculiar structure of the eye, you see them as through a glass: and you learn many of the little wonderful details in the nature of morbid processes, which, but for the observation of them in the eye, would not have been known at all.”

ON POISONING BY STRYCHNIA,

BY CHAUNCEY PUZEY, L.R.C.P. LOND.,

HOUSE-SURGEON TO THE ROYAL INFIRMARY.

On Tuesday, February 18th, 1868, at 2 a.m., a young man, about 24 years of age, was brought to the Liverpool Royal Infirmary, suffering from acute tetanic symptoms, said to be the result of poisoning by strychnia.

He stated that, *a little before 12 o'clock, midnight*, he had swallowed sixpennyworth of "Hunter's Vermin Powder," spread on bread. He had been drinking rather freely at the time. *In about half an hour* afterwards, after he had gone to bed, he was aroused by a peculiar sensation of stiffness about the toes, "and a cold shudder ran up his legs." He then tried to get out of bed, but was unable to do so. In a minute or two after, cramps came on in his legs and arms, and he felt a suffocating sensation in his throat. After this he thought he became unconscious for a few minutes, and then found himself sweating profusely. In about a quarter of an hour after, he vomited a little, and threw up (he thinks) some of the poisoned bread. His friends at this time found him, and sent for a surgeon, who gave him an emetic, and ordered him to be sent to the Infirmary. At that time he was suffering severely. He vomited as he was coming in the cab.

On admission, at 2 a.m., he was cold, with feeble rapid pulse, face congested, and skin clammy; breathing short and hurried. At intervals of every three or four minutes, a spasm came on, in the form of well marked *opisthotonos*. During the spasms the respiration became hissing, jaws fixed, eyes very prominent, face congested and livid, and the man appeared as if he would die of asphyxia.

Each spasm lasted not quite two minutes, then there was about two minutes interval, during which intervals the man was quite conscious, and described his sensations after taking the poison. Thirty minutes after admission he vomited again. (In the vomited matter, a trace of strychnia was found.) The act of vomiting was accompanied by great pain, and was of a peculiar spasmodic, jerking character. He could swallow nothing, so it was determined to try subcutaneous injection. At 2-30 a.m., one third of a grain of morphia was injected into the calf of one leg. The introduction of the needle brought on a violent spasm, but in five minutes the man expressed himself as being easier than he had been for the last two hours, and the attacks became less frequent and less severe. About 3-15 they began to increase again, and a third of a grain of morphia was injected into the other leg, with renewed benefit. Shortly before this, the patient seemed so exhausted, and the pulse so feeble,—in fact, hardly perceptible during the spasm,—that small quantities of brandy and water were frequently given, at first with considerable difficulty.

At 5-30 a.m. he had been dozing a little, and the spasms had been much less violent, but they appeared to be returning a little more frequently. Their character was, however, much altered, as they came on with sudden jerks that nearly threw the patient out of bed, causing him sudden acute pain, but unattended by trismus. A quarter of a grain of morphia was injected, and the brandy stopped, as his skin was much warmer, and pulse better.

At 7 a.m. he was again seen, and was so much better that nothing further in the way of treatment was thought necessary; but every now and then a sudden jerking spasm would seize him. These gradually became less violent, and by the afternoon had altogether ceased. He suffered from considerable pain and tenderness for several days afterwards, and slight ecchymoses appeared about the legs and arms, where the spasms had been most severe.

He went out quite well in less than a week.

It appears to me that there are two or three points in this case worthy of notice.

There seems to be no doubt that the man swallowed the whole powder. Mr. J. C. Brown, B. Sc., the lecturer on Chemistry and Toxicology at the Infirmary School of Medicine, analysed a similar powder for me, and found that it contained exactly *three grains of strychnia*. (This, according to Taylor, is usually a rapidly fatal dose). He vomited a little about an hour after taking the poison, but it must have been nearly two hours before the contents of his stomach were evacuated, for the emetic given him by the surgeon who was called to see him did not take effect until he was being brought in a cab to the Infirmary, at 2 a.m.

But after this a considerable quantity of strychnia remained in his stomach, for at 2-30 he vomited again, and in a small quantity of the vomited matter, collected and analysed by Mr. Brown, there was found $\frac{1}{8}$ of a grain.

It appears probable that the absorption of the poison had been retarded to a certain extent by the state of the man's stomach, he having been drinking spirits freely that night, and that to this fact he owed his escape from speedy death within an hour.

As regards the treatment adopted, it consisted of three things—

1st, An emetic to remove the poison remaining in the stomach;

2nd, The injection of morphia, to put a stop to the convulsions, the result of the poison already absorbed; and

3rd, Stimulants, to overcome the exhaustion due to the spasms.

Neither the first nor the second part of the treatment would *per se* have been sufficient. Of course, it would have been unreasonable to trust to the morphia whilst any poison might still be in the stomach; and it was evident to bystanders that the emetic alone would not have saved the man's life, as he must almost certainly have died from exhaustion if the tetanic symptoms could not have been relieved, and his strength at the same time supported; and in no way could this so soon be effected as by the hypodermic method.

Probably many would suggest that the administration of chloroform would have succeeded as well. But, in the first place, it appeared to me that it would be difficult to combine this with the administration of stimulants and support to the patient; and

again, I thought it a less safe method of treatment. For it seemed so likely that the man would die, during, or immediately after one of the convulsions, that I was fearful, lest, supposing such a thing occurred whilst he was inhaling chloroform, death might be attributed to it. In the *Medical Times and Gazette* of May 9th, of this year, and in that of the 27th of June, 1867, cases of recovery after strychnine poisoning are related where chloroform was found to act in the most satisfactory manner. But even supposing each mode of treatment to be equally safe, there can be no doubt, I think, which is the more convenient, where there is not a staff of assistants to relieve each other in the administration of the remedy.

The effect of the hypodermic injection was manifest almost immediately. In five minutes the patient expressed himself as being easier than he had been for two hours before, and in half an hour he was able to swallow frequently small quantities of brandy, without which it appeared likely that he would sink from exhaustion. To the necessity for the administration of stimulants in such cases, Mr. Phelps draws attention in his observations on one which he treated at the Northern Hospital in this town, five years ago, and which is the second of those I alluded to above. In his case, beef tea and brandy were injected into the stomach whilst the patient was under the influence of chloroform.

The effect of the morphia was only temporary, for the injection had to be repeated in three-quarters of an hour, and again in two hours more.

The change in the character of the symptoms, as the effects of the poison were passing off, was peculiar, the violent tetanic spasms gradually becoming weaker and weaker, and then being replaced by sudden short jerks or starts of apparently every muscle, occurring at uncertain intervals, and calling to the mind of the observer the slight and interrupted shocks given off by an electro-galvanic machine after it has been worked for a considerable time.

CASE OF INVERSION OF THE UTERUS,

By JAMES HAKES, M.R.C.S.,

SURGEON TO THE LIVERPOOL ROYAL INFIRMARY.

INVERSION of the uterus is an accident of so distressing and serious a nature as to deserve the attention of every medical man; and any safe and effectual means of reducing the inversion, when it has become chronic, will no doubt be welcomed by the profession, especially if easy of application, and productive of but little suffering to the patient.

It is scarcely possible, I think, to imagine any remedy with a more just claim to such a character than that which proved successful in the following case; and it is on this account that, notwithstanding the many imperfections in its history, I hope it may be considered deserving of a place in the *Liverpool Medical and Surgical Reports*.

It is perhaps impossible to say after what lapse of time attempts to reduce inversion of the uterus should be considered hopeless. Dr. Churchill refers to cases of success where this condition had existed for many months. The case I proceed to describe will give additional encouragement to any one who may have to treat this complaint.

Mrs. T., admitted into the Thornton ward of the Liverpool Royal Infirmary, July 30th, 1867. Age, 23. Married. Thoroughly exsanguine, and presenting all the symptoms usually following loss of blood.

She was confined of her first child March 4th, 1867. The particulars that follow were obtained from herself and her mother. She had a good labour, and only a moderate flow of blood accompanied the expulsion of the placenta. She went on

well afterwards, the lochia being rather scanty. At the end of three weeks she sat up. Two or three days after this, the red discharge returned, and, on the thirty-first of March, flooding occurred to such an extent as to make her faint. The doctor that came to see her introduced his hand and arm into the vagina, and brought away an immense amount of clotted blood; gave her a great deal of pain, and she felt a peculiar and disagreeable turning in her right side. From that time till her admission into the Infirmary, and for some weeks after this, she was never free from sanguineous discharge to a greater or less extent, nor without severe pain in the stomach and back.

She was first examined by Mr. Puzey, and afterwards by myself and others, and the following facts were noted.

The perinæum very narrow, owing to laceration at the time of labour. Vagina roomy, relaxed, and very moist. It was occupied by a tumour, reaching almost to the external parts, nearly cylindrical in shape, and very firm to the touch. Along it the finger passed about three inches, and was then reflected towards the vagina. The junction of the vagina and os uteri was very distinct, being about half an inch from the point where the finger was reflected, and formed a ring round the neck of the tumour, so that the finger passed through this contraction at every part into a cul-de-sac about half an inch deep.

No one had any doubt that it was a case of almost complete inversion of the uterus.

August 4th, 1867, an effort was made to remedy the accident. Chloroform was administered, and insensibility maintained for nearly an hour. The hand was introduced into the vagina, and by manipulation I endeavoured at the same time to compress the uterus and dilate the os uteri. Little or no impression was made on the tumour. She was in no respects improved, but the introduction of the hand had lacerated the remaining portion of the perinæum. Opium was administered, and rest enjoined for some days, in order to favour the union of the lacerated part, but without success.

I next determined to try the effect of continuous pressure.

It seemed to me certain that if an india-rubber ball were introduced into the vagina, and then blown up, it must at once compress the inverted womb, and stretch the vagina and os uteri, and that eventually the os uteri would become thoroughly dilated, and the pressure continuing to act on the uterus, this would at last be turned back again into its normal position. This idea I proceeded to carry out. The apparatus first tried was not adequate for the purpose; the hæmorrhage, indeed, ceased almost immediately under its use, but no change took place in other respects.

Eventually, Mr. Reynolds provided me with a pear-shaped india-rubber bottle, the neck terminating in a tube closed near its end by a stop-cock. By forcing air into it by means of an air-pump, the bottle could be dilated to a very considerable size without bursting. This was introduced into the vagina, and each day air was pumped in till she began to complain of pain. In an hour, or thereabouts, the pain ceased. When this had been done some days, I made an examination, and was surprised to find, not only that the tumour was unchanged, but also that the vagina was no larger than before its use. Before this examination the bottle had been removed. After a few days I examined again, the bottle remaining *in situ*. It was quite flaccid, and exerted no pressure on the canal. It was soon discovered that the stop-cock leaked, and consequently the air had escaped each day very shortly after the bottle was inflated, which fully accounted for the unaltered state of the vagina. The escape of air was prevented for the future by folding the tube in itself, and tying the fold tightly after each inflation. From that time the bottle was enlarged day by day, and when I next examined her the tumour was gone, the vagina very much distended, and the os uteri large and pulpy. Ten days later the condition of the parts was much the same. She left the Infirmary December 9th, 1867.

I regret exceedingly that no record is to be found of the date when the bottle began to be effectually used. I feel confident that it was not before the end of September, and more probably in October. The inversion must therefore have existed at least

five, and more probably six, months before elastic pressure was fairly commenced, and I believe the examination at which the inversion was found rectified was made in about a fortnight after its application.

For a long time after she left the Infirmary she remained anæmic, and suffered much from gastrodynia and other dyspeptic symptoms.

I saw her the last week in August, 1868. She had menstruated regularly for many months; and on making a vaginal examination the only abnormalities to be noticed were, a large cervix uteri, some antifixion of the uterus, and the ruptured perinæum, which I hope she will soon allow me to remedy.

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THE USE OF COMPRESSION IN CERTAIN SURGICAL CASES,

By C. H. HIGGINS, M.D., M.R.C.P. LOND., F.R.C.S. ENG.,

FORMERLY SURGEON SOMERSET COUNTY AND BIRMINGHAM HOSPITALS.

I PRESUME that few practitioners, to whom it has occurred to treat that common form of accident a "sprain," have not felt dissatisfied, if not humiliated, at the prolonged period which has intervened between the occurrence of the injury and the final recovery of the patient. However this may be, I must individually confess to have often experienced considerable disappointment formerly, on this score, with the result of such cases under my own care; so much so, indeed, that for several years past I have been in the habit of deviating more or less from the recognised methods of treatment; though I admit, until lately, with scarcely the amount of improvement I had looked for. Some four or five years ago, however, reflecting upon the circumstance that the ordinary bone-setter was credited with a better success in such accidents than the regular surgeon, I set myself to inquire wherein his treatment differed from the orthodox plan. To every such enquiry I found the same answer, viz., that his treatment mainly consisted in some form of plastering. Upon this hint I proceeded to experiment. The success which I obtained induced me to persevere, until, as I believe, I have now established something like a *system* in this plan of treatment; and having been invited to contribute something practical to the forthcoming volume of the *Liverpool Medical and Surgical Reports*, I desire briefly to draw attention to it. Before I do so, however, I must disclaim all desire or intention to exalt the bone-setter at the expense of my brother medicals; but I have always acted upon the

duties, which entail on him a great deal of walking, without pain, etc.

A short time ago I had the opportunity of testing my plan upon myself, and, what is more, of contrasting it with the treatment I was subjected to for a similar accident some years previously. I was returning home some months since, late at night, from a patient's house, and stumbled over a large stone carelessly left in the road, and met with a severe sprain of the left wrist-joint. My hand was quite powerless, and extremely painful. I caused straps of plaster, in the usual way, to be tightly applied, from the base of the phalanges to about four inches above the wrist. These were renewed three times, and in five or six days I was free from uneasiness, and could use my hand almost as well as ever, and in a couple of days or so more had quite recovered, and have never felt inconvenience since.

From this accident to myself, I need scarcely say, I had an opportunity of measuring the amount and sort of discomfort occasioned by the first application of the strapping. This I found to extend over only the first six or eight hours, and, though certainly sufficiently distressing, it was by no means so great as I had anticipated, and consequently quite worth undergoing to ensure the after-benefits of the treatment, and indeed quite compensated by the sense of security and support it produces, the absolute immobility in short, of the injured structures.

I have lately had an opportunity of proving to some extent the efficacy of compression, by the method I have described, in two or three cases of contusion, also in one case of dislocation of the elbow joint, in a member of my own family; and I may add also in two cases of gout in the foot. Here I delayed the application of the plaster strips until all inflammatory appearances had subsided. The benefit of the compression in both instances was considerable, not only from the support it afforded, but also by inducing absorption of the interstitial deposits.

When we reflect upon the nature of a sprain,—that it is indeed a kind of subluxation, a more or less partial and temporary displace-

ment, as it were, of all the structures about a joint, accompanied by considerable stretching, and even laceration of its ligaments, its tendons, its fasciæ, its vessels, and its nerves,—I think we shall be safe in acknowledging that a judicious system of compression, early employed, must be a more efficacious method of treatment for its cure than the old temporising plan of leeches, cold lotions, stimulating liniments, etc., etc., with ultimate timid bandaging.

By compression, employed in the manner I have endeavoured to point out, I do believe we can bring about, more surely and more quickly and more comfortably to the patient, the various desiderata in the cure of sprains and similar cases. In the first place, we may ensure the complete, the absolute immobility and repose of all the injured structures. In the next place, we are enabled to restrain the greater amount of the extravasation and effusion which will of necessity be poured out, in and around the joint, unless prevented. And we may also promote at once the re-absorption of all interstitial outpourings, be they of blood or of serum, which so frequently complicate the recovery in such cases, and compromise the symmetry of the parts, and we can restrain within due bounds the tension and vascular action of the parts. And lastly, I am sure now, from experience in my own person, that we shall conduce to the ultimate and not long-delayed relief of the parts involved, and therefore to the general comfort of the patient.

Whatever may be the worth of my explanation of the *modus operandi* of compression, as I have recommended it, in sprains and contusions and all analogous cases, I can unhesitatingly vouch for the superior efficacy of this plan of treatment. And if I succeed in merely drawing attention to my suggestion, I shall be satisfied, and shall feel at least *non ego frustra*.

confidence in my plan of strapping, I immediately applied a full number of leeches, and then had his limb well fomented and ultimately enveloped in a bran poultice, and enjoined complete rest in bed. The following morning I repeated the leeches and fomentation, as there were still considerable pain and distension. On the subsequent day, I timidly commenced the plan of compression, using for the purpose a common firm calico bandage, which I applied firmly. As he expressed relief from the support, I rigidly continued the compression, removing and re-adjusting the bandage as the swelling diminished. Three weeks from the date of the accident, he was able to draw on an ordinary Wellington boot and go out shooting; and in a couple of weeks more he reported himself as quite recovered, and resumed his studies.

The next case I was called to was that of a lady, about 45 years of age. She slipped down the kitchen stairs, sustaining a sprained ankle. I saw her three or four hours after the fall, and found her ankle swollen and intensely painful. I caused her to foment the limb for a couple of hours. At the end of that time, having reasoned myself into more confidence of the method, I tightly strapped the foot and ankle, from the toes to the middle of the leg, with strips of ordinary adhesive plaster. She bore the strapping for some hours, but at length, becoming impatient of the distress occasioned by the dressing as she supposed, before my visit on the following day, she had loosened and to a great extent removed it. I re-adjusted the strapping; and on the next day, finding she had again loosened it, I applied, in place of common adhesive plaster, *emplastrum roborans*, spread on linen and cut into strips like the former. Seeing me so determined, and not finding it quite so easy to remove the new strapping, she had not meddled with it; and after two or three days more, perceiving that the swelling had greatly diminished and the plaster consequently loose, I applied fresh strips as firmly as I could. The parts were by this time much less painful, and reduced, and my patient, being now convinced of the advantage of the compression, contentedly submitted to two or three renewals of the plastering, and in a month from the accident she was quite recovered, and able to walk about well.

Another case was that of a young gentleman, about 20 years old, who severely sprained his ankle in leaping from the landing-stage on to one of the Woodside boats. He was brought home, not being able to put his foot to the ground, and I saw him three or four hours afterwards. He complained of great pain, and his foot and ankle were much swollen and discoloured. I had his foot placed for a couple of hours in a bucket of water as hot as he could bear it, and then tightly and evenly strapped the limb in the way already described, from the toes to the middle of the calf, and enjoined the recumbent position; the next morning he reported a somewhat restless night and some distress from the plaster, which, as usually happens, I found loose, from the shrinking of the parts. I restrapped the limb tightly, and he expressed himself easier when the operation was finished. Two days afterwards I applied fresh plaster, and again in two days, as the limb had now nearly returned to its usual size; this was the last application of plaster, for he could now walk tolerably about the room. At the end of ten days I saw him dancing at a party, and in one fortnight from the date of his accident he returned to his office duties, perfectly recovered.

The next opportunity I had of testing my method of treatment was in the case of an officer in one of the Inman line of steamers, who had a fortnight before sprained his ankle by slipping on the ice at Halifax, *i. e.*, the day before he sailed for Liverpool. He was entirely laid up during the voyage, and when he reached home was quite lame, and suffering from pain in the ankle joint. I pursued the plan I have already so fully detailed in the former cases. He underwent four strappings, and at the end of one week, though still wearing the last dressing, he was able to walk about without pain or limping.

Lately, one of my sons in leaping a gate fell, and sustained a most severe sprain. I pursued precisely the same plan as in the other cases, and though he suffered some considerable discomfort from the first application of plaster, he recovered without a drawback, and in less than a fortnight, though much discolouration continued almost up to the knee, he was able to resume his office

principle, *Est mihi nunquam recusare etiam ab hoste doceri*, and of the bone-setter's success in certain cases I certainly entertain no doubt; although I, as certainly, have no belief in his surgical knowledge or diagnostic accuracy; on the contrary, I believe that the bone-setter, either from ignorance, or from a worse motive, or perhaps from both considerations, invariably pronounces his cases to be of a more serious character than they are; and, playing upon the credulity of his patients, unquestionably intimates, *in every case*, that there is something "out," or something "broke," to enhance his own skill. Nevertheless, I am persuaded that in many instances he hits the right nail on the head, and adopts, from experience, a sort of "rule of thumb" practice, which proves successful and maintains his reputation. This "rule of thumb" practice, then, so far as I have been able to discover, is chiefly the plan of rigid plastering, thereby securing, at the least, the immobility of the injured limb, thus facilitating the efforts of nature in bringing about the recovery.

I may add that I have never seen a case put up in the way I shall presently point out, by any bone-setter, or any other person. The plan, therefore, which I adopt has been worked out by myself upon the merest hint. And I beg to say also, that I desire to set up no sort of claim to originality; for I do not know whether the same method has or has not been employed by others. It certainly has never been alluded to or suggested by any one on this side of the Mersey, and I have seen no account of it.

The plan then which I have pursued during the last four or five years in all cases of sprain is as follows:—immediately on seeing the patient, and satisfying myself of the nature of his accident, I plunge the injured joint, say the ankle or the wrist, which are the parts most exposed to sprain, into a vessel containing water as hot as can be borne, and keep it there for at least two hours, maintaining the temperature of the water by fresh quantities of the hot. At the end of the time specified, I find the pain of the part considerably mitigated, and it is, of course, very greatly distended and swollen. Having next carefully dried the part, I proceed *at once* to strap it, (if the ankle, from the toes to the middle of the calf, and if the wrist, from the fingers to the

middle of the fore-arm,) as *tightly* and *equally* as I can, with common adhesive plaster cut into strips an inch wide, placing each succeeding piece so as to overlap the preceding one by about a quarter of its width. I always put on two such layers, and finally I direct the patient to keep the horizontal position, on no consideration to meddle with the dressing, but if much pain or distress is set up to take an opiate on retiring to rest. Upon visiting my patient on the following day, I usually receive some account of a restless night during the first hours, but subsequently of sleep and diminution of pain, etc. The plasters are generally quite loose from the shrinking of the limb, which is moreover now said to be comparatively free from pain, unless handled roughly—though of necessity much discoloured; having removed the plaster, I immediately replace it by fresh strips laid on as firmly, evenly and extensively as before; in short, exactly in the same way as on the first dressing, insisting of course on a continuance of the recumbent position. On the third day of the accident I repeat the process, this time, however, allowing two days to intervene, and I permit some movement about the room. At the end of the two days, I renew the plaster-dressing exactly as on the previous occasions, and generally for the last time, retaining this dressing until it loosens itself off, which usually occurs in three or four days, by which time I find the patient able to use his limb, and free from pain; in short, cured. Such is my proceeding in ordinary cases of sprain; where the accident is of unusual severity, I have had recourse to *six* relays of plaster instead of *four*, and up to the present time with equal success, though the cure is generally delayed three or four days or so longer.

The first case I treated on the above plan was that of a former student of the Liverpool Medical School, residing at the time on this side of the river, and at present a Surgeon in the army. This gentleman took it into his head to leap down the last four or five steps of a common flight of stairs with an adult sister in his arms. He fell with his right foot doubled under him, and suffered a most severe sprain of his ankle. I saw him shortly after the accident and found him in intense agony, etc., and quite unable to move his foot, which was already much swollen. Not having perfect

ON LOCAL APPLICATIONS TO THE THROAT AND
NOSTRILS,

By W. M. BANKS, Esq.

WITHIN the last few years the nature and treatment of the diseases of the air passages, like those of the eye, the ear, and the genito-urinary organs, have occupied the attention of some of the ablest minds in the medical profession, and have made the most extraordinary advances. The necessary result has been the introduction of numerous remedies and instruments which, till quite recently, were never heard of; and as these have appeared before the public in such rapid succession as hardly yet to have taken their places in the standard text-books of surgery, a brief comparison of the merits and *modus operandi* of some of the most useful of them may not be unacceptable.

I should imagine that, twenty years ago, when a medical man was consulted by a patient, the victim of ozæna or chronic laryngitis, a feeling, almost of dismay, must have come over him, at the prospect of how little he could really do in the way of permanent benefit. But, of late years, there has been a growing tendency to explore the more inaccessible regions of the body, and so successfully has this been cultivated, that the cavity of the uterus, of the eye-ball, of the larynx and nostrils, nay, even of the bladder itself, can now be displayed for our inspection and mani-

pulation. The result is, that, whereas we were formerly satisfied with constitutional treatment in cases of disease in those parts, or, at best, with vague and haphazard modes of local application, we can now deal with them, almost as effectually, as we can with the more patent portions of the body. In the following remarks I do not propose to offer anything in the way of a novelty, for we cannot all be discoverers;—indeed, at the present day, the race of discoverers and inventors seems to be quite prolific enough. But many a medical man, though worried with the cares of practice, yet anxious to keep up with the spirit of the times, reads in some journal of a new remedy or a new instrument;—he hears it talked of, for a time, while it is still a novelty, by his friends or at societies, and proposes to himself to employ it the first chance he gets. The case comes; but, alas, the instrument is not at hand; he is not quite sure where it can be obtained; he has somewhat forgotten the exact way in which it was to be used and the exact complaint it suits; he hesitates to order it, and falls back upon his old plan of treatment, which he has at his finger ends. As every one will admit that this is only what too frequently occurs, I must plead it as my apology for recalling to the memory of the readers of this journal what most, if not all of them, have already either seen or heard of, though perhaps not absolutely put in practice.

To begin then with the nostrils. There are few complaints more distressing than *ozæna*, which leaving the patient, as it does, sufficiently well to perform all the ordinary duties of life, is yet a continual source of misery to him—a veritable thorn in the flesh. The blocking up of the nostrils and consequent hindrance to free breathing, the alteration of the voice, the constant discharge of blood and matter and mucus, and hardened inspissated crusts, and, above all, the loathsome smell which is an inevitable concomitant of the disease, render the patient a burden to himself and a nuisance to his friends. A very great boon was conferred on such sufferers, by the discovery, made by Weber of Leipzig some forty years ago, that when a column of water is passed along one nostril, the moment it impinges on the soft palate, it causes that structure to rise upwards and completely shut off the nasal

Frederick D., and in the course of three months the disease, though not radically cured, was so palliated as hardly to occasion her inconvenience. She described to me her former condition as being something dreadful; no one would take her as a servant, and the stench was so overpowering that her very relations shunned her. At present she is in service in a family, none of whom, except her mistress, know that there is anything the matter with her. Five minutes washing out in the morning keeps her all right for the day. Nevertheless, she feels that she cannot do without this, as the nostrils still tend to get blocked up with crusts during the night. She is fat, looks well, and seems to enjoy excellent health.

A short time ago I saw a stout healthy-looking sailor lad, about 19, who for five or six years had been a victim to ozæna, which had lately become quite intolerable. On his efforts to clear the nose, he often made it bleed most severely, and the stench from the discharge was so offensive that on his last voyage home the other sailors would not allow him to sleep in the fore-castle beside them. He got one of Mr. Heath's variety of the instrument, and in a month he came back and announced with great gratitude that his nose was much clearer, the discharge was rapidly diminishing, there was no bleeding, and the fœtor was quite gone. He was going to sea in a day or two, armed with his instrument and a big bottle of Condyl's fluid. I had no doubt that he would be permanently cured in time. Even if he were not, the case of Annie R. shews that by a few minutes' washing out each morning the disease can be deprived of all that makes its victim unhappy, for the absolute pain is extremely trifling as a rule. Among the better classes, who can obtain country air, sea-bathing, and all the other aids to constitutional treatment, a complete cure is the rule and not the exception, and I know of many such which have occurred in the private practice of Mr. Bickersteth within the last two years.

There are two surgical accidents in which I am sure that Dr. Thudichum's instrument will not unfrequently be found of service. The first of these is the case of impacted foreign body in the nostril. Children, as every one knows, seem possessed of a

mania for putting beads, marbles, beans, and similar objects into the nose. They seldom put them very far, or very firmly in, and there is no doubt that the actual impaction, or fixing of them, is often produced more by misdirected attempts to get them out than by anything else. I should certainly, before using any forcible efforts at removal by instruments, see what effect a rapid stream of water passed up the other nostril would have in dislodging the foreign body. In the number of the *Lancet* for December 17th, 1864, Dr. Skinner, of this town, shewed that long before Dr. Thudichum's paper appeared he had been practically making use of the principle upon which it is constructed. Dr. Skinner discovered it by mere accident, the instrument he employed being one of Higginson's syringes. In this letter, he gave the following very interesting account of the removal of a bead from the nostril. "In June, 1860, the child of one of my patients was brought to me,—a little girl, two years of age, who had pushed an Indian bead up the right nostril. The mother had made vain attempts to pull it down, and succeeded in pushing it entirely out of sight, accompanied with profuse bleeding and terrific squalling. While the mother held the child's face over my basin, I forcibly injected some tepid water, by means of Higginson's syringe, up the left nostril, when the bead with one single compression of the elastic cylinder made its appearance in the basin."

In the second place, I think that the instrument may prove serviceable in cases of severe epistaxis. Plugging is a troublesome and disgusting remedy, and not altogether devoid of risk. Cases are recorded where serious disease of the nose has been set up by portions of the plugging having been retained. I should imagine that a stream of some dilute hæmostatic, passed through the nares, would, in many cases, suffice to stop the bleeding, and so obviate the necessity of adopting severer measures. The following case illustrates the value of the spray producer in such circumstances. It occurred in the practice of Dr. Cregeen, of this town, who has very kindly furnished the following particulars.

In September, 1867, Miss E. M., aged 20, began occasionally to spit blood, having for several months previously suffered at inter-

nervous people, the full stream of fluid should not be turned on at first, as, if this is done, they begin to splutter and cry out, the soft palate falls, the fluid runs into the pharynx, and you have the process to begin over again. The fluid should be allowed to run gently through at first, and then its volume and force increased, either by turning on the cock to its full extent or by elevating the reservoir. Also, having let a sufficient supply of fluid run up one nostril, it is advisable to insert the nozzle into the other, and reverse the current, as, by this means, the hardened crusts which have been detached, are much more easily got quit of.

As was pointed out by Dr. Thudichum, pure cold water is irritating to the mucous membrane of the nostrils, much more so than tepid water, or even than a saline solution, while this last possesses, in a marked degree, the property of dissolving the inspissated mucus, and loosening the hardened crusts. The patient should, therefore, be directed, on first rising in the morning, to run through the nose a pint or two of a solution of common salt in tepid water; about an ounce or more to the pint. This cleanses the mucous membrane, and then either a deodorising or an astringent fluid should follow. The best deoderants are Condly's fluid, the liquor carbonis detergens, and carbolic acid; about a teaspoonfull of the two first to a breakfast cup of water is enough to begin with, and about 1 part of carbolic acid to 120 of water. I tried them all successively in one patient, who gave her verdict in favour of the carbolic acid, as affording her most relief. After persevering for some time with the tepid salt and water, followed by deodorants, the mucous membrane gets clean enough to permit of the action of remedies having a permanently curative object. Of course stimulant astringents are what are indicated. The cheapest and most readily obtained is common alum, of which about 2 drachms to the pint is enough, or the sulphates of zinc and copper (from 10 to 30 grains to the pint) may be used. The practitioner, however, may employ his own favourite remedy, whatever it is, provided he follows Dr. Thudichum's advice, not to make it too strong at first, as he found that when the nasal cavity is filled with fluid, even although it be very aromatic, the sense of smell is entirely obliterated, and, the reflex effects which sub-

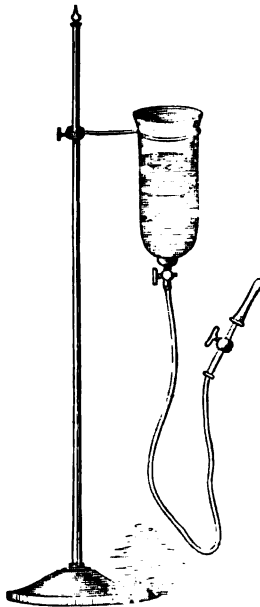
stances may exercise being thus absent, the application of very potent (and it might thus happen of *too* potent) remedies is borne without much inconvenience.

The following case shows how, when an ozæna is taken in time, a complete cure may be effected.

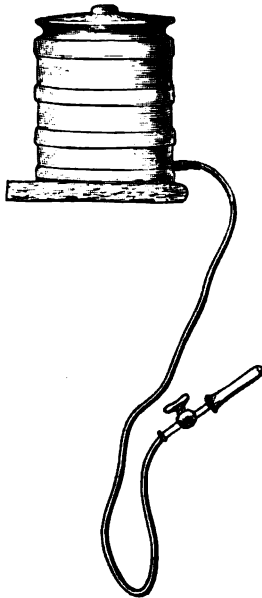
Last January I saw Frederick D., a lad of about 17, with red hair, blue eyes, freckled face, and generally strumous-looking appearance, but yet in good health and well nourished. About five months previously, a companion, who slept in the same room, noticed that he snored heavily at night. Then he himself began to feel his nose stuffed in the mornings, and soon a thickish yellow fluid commenced to run from it, which speedily assumed a very offensive odour. He never bled from the nose, nor was he much troubled with hardened crusts from the nostrils. He was ordered cod-liver oil, and to use Thudichum's apparatus with tepid water. In a week he breathed more easily through the nostrils, and did not snore so badly at night, while the smell was much diminished. At the end of a month, as the discharge, though inodorous, still continued, he was told to wash out the nares with salt and water, and then run through them half a pint of a weak solution of tincture of iodine and carbolic acid, which in two or three weeks had the effect of reducing the discharge to a thin muco-purulent condition. He came once more, after the lapse of another month, and reported himself quite well. He no longer snored, his nostrils were quite free, there was neither discharge nor odour, and he had fattened considerably upon the cod-liver oil.

I have no doubt that, under the old method of attempting to clear out the nostrils with a miserable little glass syringe, this lad would have gone on from bad to worse till his complaint became as confirmed as that of the girl whose case follows.

Annie R., when two years old, had a button up her nose, which remained there for two years. Ever afterwards she suffered from a profuse greenish discharge, accompanied by dreadful fætor, but very little pain. Till she was 17 she tried to keep it under by all sorts of injections and washes applied by the usual glass syringe, but in vain. In October, 1866, she employed Thudichum's instrument, and was treated in the same manner as



Thudichum's Instrument.



Modification of the same.

from the pharyngeal cavity, thus compelling the fluid to pass round the posterior edge of the nasal septum and emerge by the other nostril.

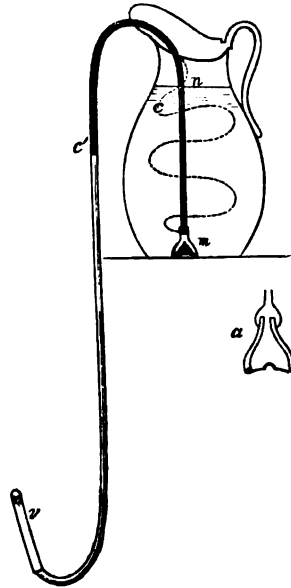
Another German professor at Halle, also named Weber, was the first to carry the principle into practice, and, in 1864, two articles upon the subject, by Dr. Thudichum, appeared in the *Lancet*, describing an apparatus which he had invented, and which has since gone by his name.

It consists of a heavily-weighted stand, having attached to it, by means of a movable arm, a glass jar, which contains the fluid to be employed. Connected with the bottom of this jar is a flexible tube, fitted at its further extremity with a perforated boxwood nozzle, and provided with a tap to regulate the flow of the liquid. The patient stands or sits with the mouth wide open and the head vertical, not thrown back, as he naturally inclines to do at the first impulse. The nozzle is fitted pretty tightly into one nostril, the tap opened, and presently a continuous stream pours out of the other nostril. The force and volume of the stream are increased by elevating the glass vessel on the shaft of the stand, and opening the tap to its full extent, and *vice versa*. As this instrument is rather a costly one, a very much simpler variety is made by Mr. Reynolds, of St. Anne Street, Liverpool, consisting merely of a white delf jar with the tube screwed into an aperture close to the bottom. The jar is placed on the top

of a table, or any high piece of furniture, and so the necessity for a cumbrous stand is done away with. The price of this instrument places it within the reach of almost any one.

Mr. Christopher Heath, however, having recognised the utility of the instrument, and being anxious to put it in the power even of the poorest dispensary patient to provide himself with it, has reduced it to the utmost simplicity, by doing away with the jar and the tap altogether, and merely having about seven or eight feet of india-rubber tubing, armed at one end with the nozzle, and at the other with a perforated leaden weight. An ordinary jug, filled with the requisite medicament, is placed, say, on the top of a chest of drawers, and the weighted end of the tube sunk in it. Into the fluid are then paid about a couple of feet of the tubing, which is next pinched between the finger and thumb, close to the margin of the liquid, and being drawn up over the edge of the jug, a syphon is formed, and the water or the saline solution, as the case may be, flows freely along the tube. By pinching the tube, the volume is diminished at pleasure, thus doing away with the necessity of a brass tap, and so the cost of the instrument is reduced to a few shillings. One great advantage of this form is that, being extremely portable, it can be easily carried about by persons who require to travel, but, when there is no such necessity on the part of the patient, the second form is, without doubt, much more convenient to manage.

In the using of the instrument there are one or two points to be attended to. In the first place, it should be seen that the nozzle fits the nostril accurately; and secondly, in the case of children or



Mr. Heath's form of Thudichum's instrument.

- a. Section of perforated metal weight.
- c. Tube coiled in the fluid.
- c'. Tube drawn over edge of jug.
- v. Nozzle.

vals from bleedings at the nose, which, however, were so slight that she never even told her parents about them. She spat up the blood on the slightest exertion, but yet her general health was very fair, she did not emaciate, the menstrual function was regular, and stethoscopic examination revealed no evidence of disease of the lungs; in short, it was difficult to say positively where the blood came from. In the early part of this year she again had some severe attacks of epistaxis, which she said nothing about, for fear of being kept in the house and "invalided," but one day in March she had an attack, in which such a quantity of blood was lost that syncope ensued. The bleeding recurred thrice in the same day, and, the usual remedies proving useless, her medical attendants plugged the nares very thoroughly. Strange to say, even while the plug was in, she vomited blood, which had evidently been swallowed. The plug was removed and all kinds of styptics were employed, together with rest, proper diet and internal remedies, such as digitalis, aconite, &c., calculated to moderate the force of the circulation, but in vain. For more than a month she had attacks of epistaxis and vomiting, from two to four times every week, till she became utterly exsanguine, as the quantity of blood lost each time was very great. In the end of April she came under Dr. Cregeen's care, who had her removed to New Brighton, in the hope that the change of air might do good. She was by this time quite blanched, her appetite indifferent, the heart extremely irritable, and she herself so weak that she could not be taken out of the carriage to cross the river, and it had to be taken over in the boat with the patient in it. It was now pretty clear that the blood came from somewhere at the back of the tonsils and *upper part of the pharynx behind the soft palate*, and the difficulty was how to reach this. From some remarks of mine Dr. Cregeen was led to employ the spray, using tincture of perchloride of iron as the styptic. It was applied through the nostrils in the usual way, and seemed to do good, as there was no bleeding for three or four days. Then occurred some slight vomiting of blood, and afterwards, on May 14th, during one of Dr. Cregeen's visits, the patient was seized with an attack of epistaxis so severe that it was with difficulty she rallied from it.

The pupils were dilated to their utmost and insensible to light, and the patient became slightly delirious, tossing her arms about and muttering incoherently. The blood which ran from the nose was of the colour of sherry, and so devoid of fibrine that it would hardly coagulate. Dr. Cregeen tried to throw the spray up behind the soft palate, but she could not endure it. It was clear, therefore, that by the usual plan of blowing the spray up one nostril and down the other, the soft palate prevented its reaching the proper place, and, as she could not bear it when applied by the throat, Dr. Cregeen adopted the plan of putting the tube up one nostril, closing both the other nostril and the mouth, and then rapidly blowing in about a drachm and a half of the perchloride of iron with the spray producer. The valve action of the soft palate being thus destroyed, the iron reached the very top of the pharynx and ran down, drenching all the surrounding parts; the patient could feel it running down. This was done every day for a fortnight; she did not lose a drop of blood during that time. Dr. C. then began to dilute the perchloride of iron, when, in a day or two, she began to hawk up a little blood, and he again resumed the full strength. The spray was continued till July 22nd, and for some time at first it was noticed that whenever it was discontinued the patient felt symptoms of fulness in the head and throat, which always preceded an attack of bleeding. At the end of that time she was well enough to take carriage exercise, and was recovering strength. She accordingly went to Cumberland, having had no hæmorrhage for a long time. She quickly recruited there, and has never since had a return of her malady. To the effectual application of the perchloride of iron to the proper place, Dr. Cregeen very justly attributes his patient's recovery, as, previously to this, every possible means had been vainly tried, by several medical men, as well as by himself, to stop the bleedings.

I tried the iron myself in a very bad case of epistaxis, where repeated attacks of bleeding were rapidly exhausting the patient. Being an ignorant obstinate man, he positively refused to be plugged, saying he would rather die. I found the iron here

exercised very marked control over the hæmorrhage, and, the means of applying it being so simple, the patient's wife was able to give him a dose whenever an attack threatened, and so to cut it short.

Dr. Thudichum's instrument then, as we have seen, is highly applicable to cases of ozæna, or of true ulceration of the mucous membrane, or of caries of the spongy or nasal bones, where there is great discharge and fœtor. But the general practitioner is often also consulted, at any rate in the first instance, in cases of nasal polypi. Now, if unwilling to perform the operation of evulsion himself, and equally unwilling to hand over his patient to an operating surgeon, I would suggest a trial of a method of destroying them, proposed by Mr. Bryant about a year ago. It is well known that nasal polypi are seldom or never single, and that, after having removed all the larger ones with the forceps or wire noose, there is too often a crop of young ones left behind, which soon sprout up and involve a second, a third, and often several operations, before they are all got quit of. Mr. Bryant hit upon the happy idea of blowing tannin into the nostrils, after the operation of evulsion, for the purpose of withering up the young succulent gelatinous brood, which remain behind; and in this he was so successful, that he also tried it on the larger ones, and with very marked benefit. During the past year, I have used it in a few cases myself, and, in one or two, the effect has been most satisfactory, the polypi having either shrunk away, or actually dropped off, and so the patient has been spared the misery of undergoing a painful and very repulsive operation. A few grains of tannin are simply put into a quill, which is inserted as far as possible into the nostril, and then, with a puff, the powder is blown out over the mucous membrane. This, however, involves the presence of a second person to blow the powder up the nostril. I have found that this can be obviated by having the tannin put into a hollow india-rubber ball, with a short wide nozzle attached to it. A smart compression of the ball sends the powder flying up the nozzle, and so the patient can employ the remedy himself.



These little implements are now sold in all druggists' and surgical instrument makers' shops, for the purpose of giving small injections. The nozzle of course must come out to allow of the powder being poured into the ball, and the tannin itself should be finely pulverised. The successful cases which I had were in young girls, and I should think that the remedy will act best where the polypi are not of very old standing, and seem to be soft and gelatinous. Mr. Bryant, however, details several cases, where it acted on polypi of very old date. He

remarks at the beginning of his paper: "I am disposed to regard it as a practical wrinkle of no mean value in the treatment of a hitherto very intractable affection, and it is with some little pleasure that I now bring it publicly before my professional brethren." As far as my limited experience goes, though not so sanguine as Mr. Bryant in my expectations of the success of this remedy, it is certainly worth a trial, and especially in the cases of persons who, from timidity, prefer going about with their malady, to submitting to the pain of an operation. To such it gives a chance. As to its use after evulsion, as a means of keeping down any of the young brood which may have been left behind, that is unquestionable.

There is still another morbid condition of the nostrils, for which patients often seek advice. In these cases, the person continually has a sensation of having his nostrils stopped up, and is constantly blowing his nose to clear them out. The organ is always running water, and the patient speaks as if he had a bad cold in the head. Indeed, the symptoms are practically those of a chronic coryza, and are due to a chronically swollen and thickened condition of the mucous membrane. No doubt this can be brought on by repeated attacks of "cold in the head," but I believe it is to a great extent a constitutional affection, just as we find to be the

case with chronic follicular disease of the pharynx lower down. In the way of constitutional treatment, the iodide or bromide of potassium offer most hope of benefit. These salts seem to act upon the homœopathic principle of "like curing like," as, when given in overdoses or for too long a time, they produce the very train of symptoms I have just mentioned. Locally, astringents are undoubtedly indicated. Now, for the application of these, Thudichum's instrument is rather clumsy, while blowing pure tannin into the nostrils is rather too severe a measure. By far the most elegant contrivance, then, is that with which we have all recently been made acquainted, in connection with the use of sulphurous acid by Dr. Dewar's plan, viz., the spray-producer. The cloud of spray, thrown from it when it is inserted into the nostril, permeates every chink and cranny, and seems to act upon the soft palate, just as the fluid in Thudichum's machine does, since, if you ply the bellows-ball strongly enough, the spray will be seen to issue from the opposite nostril to that in which the instrument is inserted. By this means, the whole Schneiderian membrane receives a most thorough drenching. As to the fluid to be used, either tannin in solution or iodine are the best. If the tannin be used, the *Glycerinum Acidi Tannici* of the new *Pharmacopœia*, in the strength of one to two drachms to the ounce of water, will be found the most elegant mode of using it. The objection to using iodine, hitherto, has been that it stained the patient's skin and handkerchiefs and everything it touched. About six or seven months ago, however, I noticed a short letter in the *Lancet*, stating that the addition of a little carbolic acid not only prevented this nuisance but was a desirable addition in itself. I have used it since very freely, and seen it used by others, and find that it answers extremely well, and is probably the best and most generally applicable remedy in use.

Having now discussed some of the best methods of applying remedies locally in the case of the nares, it may not be amiss briefly to notice how a similar plan of treatment is to be adopted with the throat.

The affections of the throat most commonly met with are, speaking very roughly and generally, as follows: — (1) Ulcer-

ation of the larynx either of a syphilitic or of a tubercular origin ; (2) chronic follicular disease of the pharyngeal mucous membrane associated with more or less hoarseness and pain in speaking, known as *dysphonia clericorum* ; (3) aphonia, or loss of voice, which when merely temporary is only the result of congestion of the mucous membrane of the vocal cords after a bad cold or a sore throat, but when permanent generally proceeds from defective action of the laryngeal muscles. This defective action is due, either to some distinct paralysis of the inferior laryngeal nerve, or to extreme general debility. Of course, there are many other affections, which come under the notice of the specialist, but these are the most commonly met with in the general run of practice.

The desire to obtain some means by which we might actually bring our remedies in contact with the affected air passages, has led to the invention of numerous instruments for that purpose. Inhalation of the steam of water, impregnated with the medicinal agent, was the first idea ; and of inhalers there is literally no end. To this succeeded Rauchfuss's plan, of squirting in the remedy itself, in the form of very fine jets ; and, after sundry modifications, this resulted in the production of an injector, consisting of a silver or vulcanite tube, curved to suit the larynx, and having one end perforated with numerous fine holes. To the other end was fixed a hollow caoutchouc ball, which was filled in the same manner as the enema apparatus which are now in common use, and, when firmly squeezed, forced the liquid in a fine shower through the holes in the perforated extremity. These instruments were very much used a few years ago, and some of them were constructed with long stems, for the purpose of being passed up into the uterus and along the urethra. Next came the "Pulverisateur," of Dr. Sales-Giron, in which, by means of compressed air, the medicated fluid was forced through a tube with a very fine aperture against a metal plate, by which the stream of fluid was arrested, broken into spray, and inhaled by the patient. But the greatest improvement of all was the invention of Dr. Bergson of Berlin, of two glass tubes, with capillary points placed at right angles to each other, so that the further end of one of them being placed in fluid and a stream of air forced through the other, the fluid was sucked up through the former and

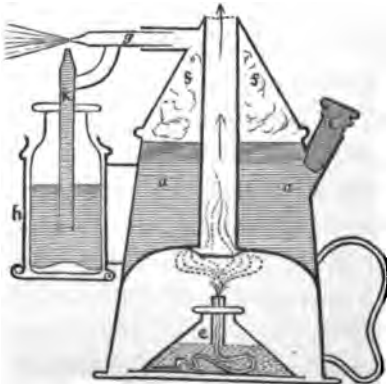
distributed in the form of spray. Every one speedily became familiar with this under the shape of the "Odorateur." Dr. Siegle of Stuttgardt, adopting this invention, constructed an instrument in which steam is made the dispersing agent, and, till quite recently, this was certainly the best apparatus of its kind, sending the remedy, in the form of spray, combined with a jet of warm steam, right to the back of the throat, and permitting of its being drawn down into the lungs at every inspiration. The price of these instruments, varying from thirty to fifty shillings, was, however, a drawback to their general use, for one does not like to ask a patient to expend so much money on what *may*, after all, not prove serviceable to him, while poor people positively cannot afford it. Last year, Dr. Adams of Glasgow most ingeniously contrived

to simplify the apparatus, just as Mr. Heath has done with Thudichum's machine, and has reduced its price to a matter of five shillings, rendering it at the same time much smaller and more easy to work.

The instrument, which is made of block tin, and is only about five inches in height, resembles very much a common lamp. It consists of a tubular boiler (*a a*) with an opening into which the water is poured, and which is fitted with a cork (*c*) which acts quite efficiently as a safety valve, since, should the pressure of the steam prove excessive, it will certainly be blown out before the boiler will burst. From the position of the opening only the proper quantity of water can be poured into the boiler. The lamp (*e*) being lit, steam is generated in the upper part of the boiler (*f f*), and



Dr. Adams' steam spray inhaler.
External appearance.



The same. Sectional view.

rushing through the upper tube (*g*) which leads from the boiler, it sucks up the medicated fluid from the bottle (*h*) along the lower tube (*k*), and carries it along with it in the shape of a warm soothing mist. The advantage of the tubular boiler is, that the steam is generated quicker, and a fuller supply kept up, while it is at the same time super-heated and dried. In simplicity and ease of management this instrument, if steam is desiderated, cannot be surpassed, and it may be safely intrusted to the care of the most inexperienced nurse or servant without fear of danger.* Dr. Adams's instrument is capable of being used in all diseases of the throat and larynx, but my own impression is that the steam does best when the bronchi are to be reached. Cases of gangrene of the lung and fetid bronchorrhea can be deprived of much of their loathsome nature by this means; and in many cases of chronic bronchitis and phthisis, when the hacking night cough deprives the patient of his sleep, a most soothing effect can be obtained by a good inhalation, before bedtime, of some balsamic or narcotic tincture.

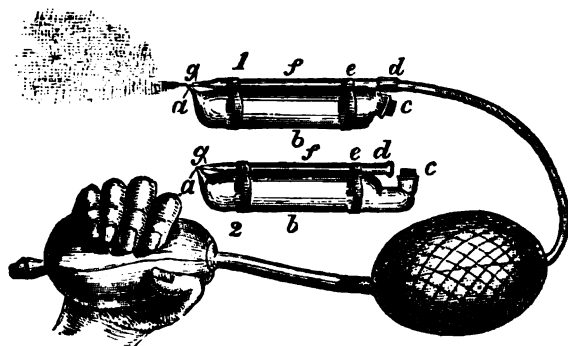
Within the last eighteen months, since the rise of the great sulphurous acid mania, not only the profession, but the general public, have become familiar with the instrument which goes by the name of "*The Spray-producer*," and which consists of a modification, by Winterich, of Bergson's tubes, having attached to them Dr. Andrew Clark's hand-ball, by which air is employed as the atomising medium. The adjoining woodcut represents the



instrument. Messrs. Mayer & Meltzer, of Gt. Portland street,

* Mr. Reynolds keeps this instrument in stock, and has added, at my suggestion, a small wooden mouthpiece to guide the jet of steam to the patient's mouth and prevent its going over his face.

London, keep the tubes with points constructed to direct the jet of spray either directly backwards against the pharynx, or upwards behind the soft palate, or downwards to the larynx. They also have a smaller tube, intended for the nostrils, the delicate point of which being protected by a small vulcanite ball prevents the patient doing it or himself any harm. Last February, in the *Medical Times*, a new form was made known to the public by Dr. Brakenridge, which is intended to be portable, and capable of



Dr. Brakenridge's Portable Spray Producer—(two forms).

a. b. c. Lower tube, acting as a reservoir. d. f. g. Upper tube. e. Connecting bands.

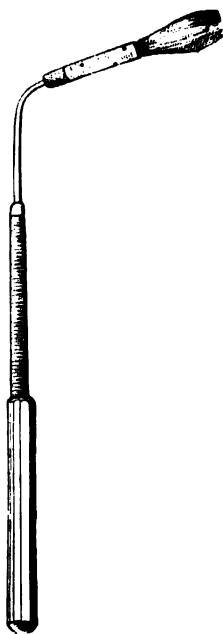
being carried in the pocket without fear of breakage. As seen by the illustration, the bottle is dispensed with, and the lower tube fulfils the office of a reservoir. The instrument, enclosed in a neatly fitting leather case, is about four inches in length.*

The value of the spray producer is so self-apparent as to account at once for its popularity, and one of its principal merits is, that it can be worked by any body after a single trial. Very few people, as a rule, can swab out the larynx satisfactorily, and patients, after a little while, are apt to get tired of the trouble of fixing up the larger instruments in which steam is the atomising agent; but this is small, portable, easily managed, and ready at a moment's notice. Of its applicability to cases of disease of the nasal mucous membrane I have already spoken, and its value in chronic throat affections I have thoroughly satisfied myself of; but I am also sure that we have in it a most efficacious weapon in com-

* Obtainable from Mr. Gardner, 46, South-bridge, Edinburgh.

bating such serious acute affections as putrid sore throat, scarlatinal cynanche, and diphtheria itself. Hitherto one of the greatest desiderata has been to obtain some means of getting at the disease after the swelling of the parts has rendered useless our attempts by the ordinary methods of gargling, or swabbing, or touching with solid caustics, while the patient has become too exhausted to undergo the fatigue of inhalation. In such a case, if we can only introduce the nozzle into the patient's mouth and get him to draw down the disinfecting spray as it is poured forth from the instrument, we may not be too late to check the advance of disease. In the August number of the new journal, "*The Practitioner*," Dr. Beigel, whose labours have tended greatly to popularise the use of atomised fluids by inhalation, has drawn attention to this very point, and strongly advises the use of spray in croup and diphtheria. As to the remedies to be employed, I need say little or nothing, they depend so much on the special case to be treated. As astringents, alum, nitrate of silver, and the glycerine of tannic acid, are in universal use; and as antiseptics, iodine, carbolic acid, and though last, not least, the much-talked-of sulphurous acid, are probably the best. There has been a good deal of writing lately upon the value of iodine inhalation in diphtheria, and I think that the compound of iodine and carbolic acid, which I referred to a short time ago, will be found a very excellent remedy. Dr. Beigel, in the paper just referred to, gives the preference to lime water (about 1 to 80 of water), (to which is ascribed the power of dissolving the pseudo-membranes of croup and diphtheria), and repeats the inhalations every two hours.

One more point I should like to mention. Valuable as is the spray producer in all laryngeal affections, it is obvious that by it we cannot make use of remedies so potent, that while they act beneficially on the limited diseased part, will yet injure the neighbouring healthy surfaces. For instance, we may wish to touch the vocal cords and the epiglottis with a sixty or eighty grain solution of nitrate of silver, but it would never do to saturate the mouth and fauces and pharynx with this also. We must then have recourse to swabbing the larynx itself as first proposed by Dr. Green. The original instrument used for that purpose consisted



Laryngeal Brush, with
Aluminium stem.

of a round sponge fixed on a bent whalebone stem. Now I feel sure that with this sponge, nine times out of ten, the larynx proper is never reached. It scrapes along the pharynx, impinges on the epiglottis and doubles it up; the patient gasps and chokes, and we are glad to pull it up before it is really half way down. The form of this swab was afterwards very much improved by the bent part of the whale bone stem being elongated, while the sponge, in place of being round, was cut long and narrow so as to slip into the larynx. But I am certain that a brush is the proper thing to use. Sir Duncan Gibb, than whom we have no better authority on such points, says, "I have wholly abandoned the sponge, from the irritation it produces, and the manner in which it scrapes and injures the delicate membrane of the larynx." I fully assent to his

his remark, and am sure that after using the brush any one would at once discard the sponge. In passing the brush, a little nicety makes all the difference between getting the remedy on to the spot and not. Make the patient open his mouth widely and permit his tongue to lie flat in the floor of the mouth, or if he cannot, then press down the base gently but firmly with a speculum (nothing answers better than the handle of a tablespoon for this); then wait a second, and ask him to take a full steady inspiration; at that moment the soft palate generally rises a little, the glottis is open, and you slip your brush rapidly down upon the vocal cords. In the way of remedies to be used, nothing can come up to nitrate of silver, and from forty to eighty grain solutions can be quite safely used, and with as little irritation as weaker ones. However, there is one form of very irritable pharynx to be met with—not true follicular disease, but where the mucous membrane at the back of the throat seems dry, glazed, and angry-looking, and for that variety equal parts of glycerine and turpentine will be found much more soothing than the nitrate of silver. In the very practical and

valuable "Therapeutic Memoranda," which recently appeared in the *British Medical Journal* from the pen of Dr. Symonds, I see that that gentleman also strongly recommends the turpentine and glycerine for a variety of throat affections.

In concluding these somewhat desultory remarks, I would observe that any practitioner who wishes to treat diseases of the nose or throat upon rational principles, and with anything like a certainty of success, must undoubtedly employ local remedies; and of the various instruments for that purpose which I have mentioned in this paper, I would recommend the following:—Thudichum's modified apparatus, as sold by Mr. Reynolds; the "Adams" Inhaler, a spray producer (Dr. Brakenridge's form, if it is to be carried about), and a laryngeal brush. Armed with these, and a few bottles containing nitrate of silver solution, tannin and glycerine, iodine and carbolic acid, Condyl's fluid and turpentine, he will do his patients more good than if he poured the whole Pharmacopœia into their stomachs. I do not, at the same time, wish it to be understood that internal remedies are useless; far from it. Every means should be taken to keep the patient's health up to the mark, by the use of tonics, cod-liver oil, good diet, fresh air, and all the hygienic measures in our power. But what I desire to shew is, that now-a-days we have the means of getting at the parts themselves, and that, such being the case, we should no more treat diseases of the nose or throat by constitutional means alone, than we would think of treating a strumous ulcer on the leg by cod-liver oil, and quinine and iron, without washing and dressing the sore place itself.

TWO AMPUTATIONS,
TREATED UPON M. MAISONNEUVE'S METHOD OF
PNEUMATIC ASPIRATION,

WITH REMARKS,

BY ROBERT HAMILTON, F.R.C.S.,

SURGEON TO THE SOUTHERN HOSPITAL.

M. MAISONNEUVE has announced to the British medical world, in the first number of the new monthly magazine, *The Practitioner*, his method of treating amputations by pneumatic aspiration; and, as he there speaks of it as sanguinely as when he described it to the Academy of Science more than a year ago, it is a proof that the frequent opportunities he has had of testing its value in the wards of the Hotel Dieu, during the interval, have only confirmed his first belief in its success.

The mortality after amputations in this country does not bear the same high ratio to recoveries that it does in the Paris hospitals, nor can it be allowed of that mortality that ninety-five per cent., as stated by M. Maisonneuve, in his *Mémoire sur les Intoxications Chirurgicales*, is due to poisoning of the system through the wound. In primary amputations it is often the amount of shock the system received at the time of the accident, or of other injuries received at the same time, which lead to the fatal result after the operation.

In secondary amputations, in many cases, the condition of the patient is such, prior to the operation, through exhausting discharges, or the presence of disease in other organs, that the faint hope of saving the life through removal of the limb is not realised. Making, therefore, a larger deduction than five per cent., probably thirty per cent., for these and other causes of mortality

after amputation, there still remains a great proportion, seventy per cent. of deaths, which may be allowed to be due to the active agency of a noxious organic life, present in the atmosphere surrounding the patient, which finds a ready entrance into his system by its action upon an open suppurating surface.

We are therefore in a position to welcome with gladness any plan offering a prospect of preventing this great cause of mortality, which, during the seasons when pyæmia, erysipelas, or gangrene are prevalent in the wards of a hospital, plays sad havoc among the amputations, many a life being cut short on these occasions which in private practice would have been saved.

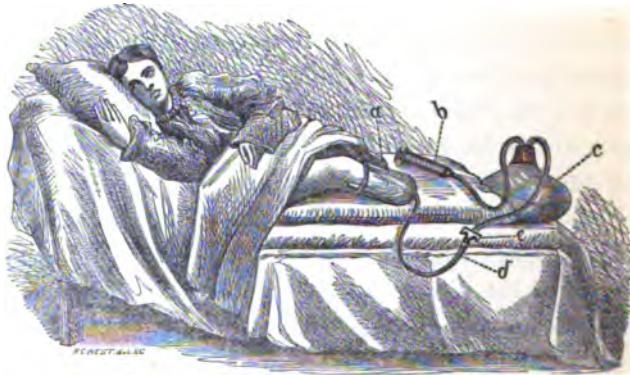
The apparatus for carrying out the principle of exclusion of air from an amputated stump has been described by its author in the journal alluded to.* It will suffice now if, in the history of the two cases in which I used it, I explain the mode of its application. By the aid of the illustrations it will be fully understood. The first case was an amputation of the leg.

E. G., æt. 36, servant, unmarried; disease of right os calcis, four years' duration. About twelve months previous to the present operation, a large portion of the os calcis was sawn off; the wound healed but slowly.

It was not till Christmas, 1867, she was discharged from the hospital. She was again admitted in March of the present year, with the foot and ankle much inflamed, having a sinus leading from the old wound to necrosed bone. The os calcis seemed altogether unsound. Various considerations, connected with her general state of health, decided me to amputate the leg. The operation was performed April 8th, at two o'clock, under chloroform. An antero-posterior flap was made, the latter being somewhat the longer. One artery only was tied. Torsion was sufficient to check hæmorrhage from five others. The wound was sponged well with carbolic lotion. The flaps brought together by four sutures. No strapping used. A few pieces of lint, soaked in

* The instrument used is precisely similar to that made by Charriere for M. Maisonneuve, and was procured from Mr. Salt, of Birmingham, who made it from the pattern brought over by Mr. Gamgee and used by him in 1867.

carbolic oil, were put round the stump. The patient was then removed to bed, and the pneumatic apparatus fixed. First, the india-rubber bag, or hood, was drawn over the stump, without removing the lint; its free border reached nearly to the knee; then both it and the receiver with which it was connected were exhausted of air by means of the air-pump.



No. 1.

The sketch shows the appearance of the limb, and position of the receiver, after all the steps in the process are complete. The hood (a) closely grasps the limb, the air-pump (b) has been worked, exhausting the air from the receiver (c), and of necessity drawing all the air intervening between the stump and hood along the tube (d) into the receiver. The compression exercised by the hood on the stump was an evidence that the air was exhausted.

The arranging of the apparatus gave little or no pain to the patient, not even when being exhausted of air; the only painful part is the drawing on of the hood, as the latter is made to be close fitting, it is drawn on with some difficulty, even though elastic. The tube (d), after the tap (e) is closed, can be withdrawn from the glass receiver, and the latter with brass pump removed, and kept in readiness near. It is more convenient, however, to keep them *in situ*, and not to have to fix on the tube every time the air-pump has to be worked. By withdrawing the cork through which both tubes enter the bottle, the latter can be removed and emptied.

Previous to the operation, the patient's pulse was 84, respiration 80, temperature 96°.

11 p.m. — Vomited once since the operation, complains of excessive faintness. The tap turned, and the syringe worked two or three times, to tighten the grasp of hood, which had relaxed somewhat.

9th, 7.30 a.m. — Had slept at intervals during the night, no vomiting. Pump again worked. Pulse 80, respiration 26, temperature 101½°.

9 p.m. — Has vomited once to-day. Feels very sleepy, but leg starts, and prevents sleep. Can take little nourishment beyond a drink of iced milk, a feeling of excessive nausea prevents her. Pump worked, and this time two to three ounces of bloody fluid passed into the receiver. The stump through the hood feels very hot, its temperature is much greater than that of the skin in the axilla, whilst the leg just above the hood has a lesser temperature than the axilla. Lint dipped in an evaporating lotion to be applied on hood, and directions given to change it frequently. Pulse 96, respiration 34, temperature 101°.

10th. — Has passed restless night, through pain and starting of limb. No actual vomiting, but feeling of nausea continues. Temperature 99½°, pulse 76, respiration 32.

10 p.m. — Pulse 86. The pump worked night and morning, the fluid has increased in quantity, and more purulent. The receiver is detached each time, and emptied, washed, and replaced at once.

11th. — Pulse 96, temperature 98½°, respiration 34. Up to this time the colour and general appearance of limb immediately above the hood was quite natural, no swelling, redness, or tension, but to-day a blush of redness was observed on the outside of leg, extending to the knee. She had slight rigors during the night. The discharge drawn into receiver smelt very offensive.

12th. — The pulse continues to rise, being to-day 118, temperature 104°. The erysipelatous blush has increased considerably, and she complains of a good deal of pain in the leg. I therefore determined to remove the hood. On doing so, the lint which enveloped the hood came off with it; the lint was saturated

with pus, which smelt abominably. Appearance of stump: the edges of the flaps were inflamed and pouting, except where held together, and deeply grooved by the sutures, two of the latter had ulcerated through, and the skin and subjacent tissue had sloughed to the extent of a shilling. The sutures were removed, care being taken not to allow the flaps to fall apart, which they probably would have done if unsupported. The redness which had been observed above the hood was an isolated patch, about the size of the hand, not extending down to the edge of flap. The stump was well washed with carbolic lotion, dried, and the hood, after being thoroughly cleansed, was re-applied.

13th.—Had a good deal of pain in leg all yesterday, but slept well last night. The redness, as much of it as can be seen above the hood, is considerably diminished. Pulse 96°, temperature 98½°, respiration 30.

14th.—Much the same, the quantity of purulent matter drawn off daily varies from four to six ounces.

15th.—The hood was again removed, in consequence of considerable enlargement of one of the inguinal glands. A line of tenderness could be traced up from the stump to it. The skin about the gland was inflamed, and excessively tender. She had again had rigors during the night. The stump was pale, the redness had disappeared, there was no bagging, the flaps were uniting, and a fair amount of pus bathed their surfaces. Considering that the threatened suppuration of the inguinal gland was due to the confinement and compression unavoidable to the use of the India-rubber hood, the natural action of the skin being by it interfered with, and the process going on in the granulating surface of flaps disturbed, if not positively reversed action set up, which might lead to purulent absorption or phlebitis, I discontinued the use of the apparatus. The stump, after being well washed, was dressed with two strips of plaster, lint soaked in carbolic oil, and a short bandage to keep on the latter. This dressing was daily renewed. The gland in the groin suppurated, forming a large abscess, and for a few days causing great constitutional disturbance; it was opened on the 26th of April. After this the recovery was rapid, the stump was quite healed in a month from the operation.

The next case was an amputation of the arm.

Charles M'Ardle, aged 27, shipwright. — Admitted into Southern Hospital July 7th, 1868. Disease of left elbow and wrist joints, existing five years. Commenced in hand, which was crushed, and the metacarpal bones of first and second finger fractured; strumous growth appeared, three or four months after the accident, emerging from the wound; the wrist-joint then became thickened, enlarged, and diseased, and about two years ago the elbow-joint became implicated. The whole limb now is wasted to half the dimensions of the other, except over the affected joints, where it is abnormally enlarged. Strumous constitution, mother died of phthisis.

July 15th.—Having improved in appetite, and being in better



No. 2.

The drawing shows an assistant exhausting the air from the glass receiver, after the patient has been removed to bed, and the tube proceeding from the hood fitted into the cork of the bottle. The pumping out of the air is causing the hood to grasp very closely the stump, and, when the latter is sufficiently compressed, the tap on the tube is closed, and the pump laid by the side of the bottle.

condition than when admitted, I amputated the arm about two inches above the elbow, the patient being under chloroform; double flaps, two ligatures only applied, hæmorrhage from other arteries checked by use of torsion forceps. No sutures used, but after washing cut surfaces and whole of the limb with carbolic lotion (1 to 40), and well drying it, three strips of plaster brought the flaps into apposition, and then the stump was enclosed in the hood of pneumatic apparatus without any lint or bandage intervening.

9 p.m. — Quite comfortable; had not slept, but felt easy. Pulse 84. No sickness. A jar, filled with cold water, was suspended close to the limb for the purpose of keeping the india-rubber bag cool by irrigation.

16th, 11 a.m. — Passed a comfortable night. Pulse 80. Skin moist. No swelling of arm above the bag. Irrigation continued. The pump was used about every eight hours, drawing into receiver on each occasion, after the first time, three to four ounces of sanguineous fluid.

17th, Friday, 11 a.m. — Pulse 90. Vomited once this morning, shortly after taking some bread and milk. Feels the great heat of weather a good deal. Perspires very freely. Heat of skin, somewhat more. No inclination for food of any kind. Appearance of arm, above hood, pale and healthy; no swelling or tenderness. The end of stump feels, through the bag, expanded, and of much greater circumference than the arm above. This only applies to the immediate extremity, for the rest of the arm enclosed in the bag feels soft, and of the same dimension as that above the margin of the hood. 8 p.m. — Pulse 102.

18th, 11 a.m. — At eleven o'clock, last night, he woke up from a short sleep in a great fright, the arm gave a violent jerk, in a few minutes he vomited some arrow-root he had shortly before taken. Then he became very cold, inwardly cold, and shook very much. The rest of the night uneasy, and no sleep. Pulse is now 120. He vomits shortly after taking anything. Heat of skin much increased. The appearance of arm, above hood, unchanged; no swelling, or redness, or tenderness. The fluid drawn off into receiver more purulent, not offensive in smell, and the quantity about five ounces.

9 p.m.—Felt very poorly all day. Nothing will stay on his stomach. Tongue much furred. Pulse 126. No change in appearance of stump. Four ounces of purulent fluid drawn off. Feeling satisfied that the unfavourable symptoms now present must be attributable to the hood, and taking into consideration the man's enfeebled condition previous to the operation, and the state of his lungs, in which tubercular deposit, it was even then feared, had begun, I did not deem it advisable to risk further delay with the hope of an improvement in the symptoms, but determined to remove the hood. Upon doing so, the appearance of the stump was found to be most satisfactory, and very different from that presented in the last case, when uncovered for the first time. Skin, pale and soft, not the slightest inflammation; flaps adherent, and, where not covered by plaster, considerable bulging of tissue, so as to overlap the edges of the plaster; still these projecting portions of the two flaps were adherent by their adjacent surfaces, as much so as the parts held in apposition under the plaster. Under the latter the granulating surface did not project beyond the level of the skin. There was no bagging. The circumference of limb was not greater in any part beneath the hood than above it, except at the immediate extremity, which had expanded into a club-stick form, from the pressure of the hood being less there than elsewhere.

The limb was washed with carbolic lotion, fresh strips of plaster applied, and lint soaked with carbolic oil. Over all, two or three turns of a bandage. The pneumatic apparatus was not re-applied.

19th, 11 a.m.—Pulse gone down to 108. No vomiting all night, but felt much more comfortable. Slept a good deal. Inclined to take food. Stump again dressed.

20th.—Pulse 104. Stump again dressed; no swelling; no separation of flaps. Slept well all night. No sickness all yesterday. Appetite greatly improved.

21st.—Good night; slept well. No sickness. Pulse 86. Wound contracting rapidly.

22nd.—The progress from this time was rapid. He was allowed to get up and walk about the ward to-day.

August 22nd.—The stump was completely healed. Sent him to Southport for three weeks.

It may seem premature, on the observation of two cases only, to draw unfavourable conclusions as to the value of a new method of treatment, but, without condemning M. Maisonneuve's plan, believing that its modified use may be found of great advantage under certain circumstances, I would point out the objections which its adoption made patent in the cases related.

Firstly.—The uniform compression of a stump has the disadvantage of producing at the point where the pressure ceases, be it six or eight inches up the limb, an engorgement of the capillaries and other vessels, whilst restricted action necessarily follows throughout the compressed portion.

Secondly.—The amount of suction exercised upon the cut tissues, every time the air is exhausted causes an excessive exudation, which is seen in the amount of fluid drawn off, after the first twenty-four hours into the receiver, the quantity varying from two to six ounces, a quantity much greater than is secreted in the same space of time, under the ordinary method of treating amputations. Much of this fluid is charged with reparative material, which is thus abstracted, instead of being used up. What a waste of material, and consequently of power is here.

Thirdly.—An air-tight India-rubber bag interferes with the normal action of the skin, there is no evaporation, and the hood becomes very hot. This suspension of the principal function of the skin in the immediate vicinity of the lesion, must tell injuriously on the latter, though one of its results, the great heat of the hood and limb, can be obviated, and was so in the cases related by the use of an evaporating lotion in the one, and of irrigation in the other. The checking of the very important functions of the skin, absorption and secretion, has, however, deeper effects than this.

Fourthly.—When the suction induced by the pumping ceases, re-action takes place, for with the most closely fitting bag, exhaustion or suction is not constantly going on, but ceases shortly after the pumping is discontinued; and then, probably at the

junction of the constricted with the unconstricted portion of the limb, absorption sets in, an absorption varying in intensity according to the amount of constriction existing below, but continuing until the next pumping takes place. For the first day or two it may be only harmless blastema, some of which is thus forced into a retrograde course; but from the third day, when cells possessing varying degrees of power, to use Dr. Beale's expression, are evolved, for the production of the different tissues; and when many of the cells lose formative power, and become degraded, though not inactive; then these degraded cells, which we call pus corpuscles, are apt to be drawn into the circulation, and give rise to local or remote mischief.

This is what happened in Mr. Gamgee's unfortunate case, which he has so graphically described in the 2nd volume of the *Lancet* for 1867, at pp. 484 and 670. In this instance, it was an amputation of the thigh, and probably the first case in this country in which the pneumatic apparatus was tried. The patient died on the forty-fifth day after the operation, but the unfavourable symptoms set in on the sixth day. The autopsy revealed the femoral vein filled with pus, and considerable collections of matter under the deep fascia, between the muscles and under the femoral vessels, at the middle of the thigh. The stump was quite healed, and the viscera healthy.

In the first of the two cases I have related, there occurred an absorption of pus corpuscles on the third day by the superficial layer of lymphatics, which produced a blush of redness, and inflammation at the spot where the further progress was arrested, the cellular tissue immediately below the skin, in the neighbourhood of the knee-joint. This was checked by the removal of the hood, and probably the suppuration induced found an exit in the stump, to which it was so near. Again the suppuration in the inguinal glands commencing on the sixth day, forty-eight hours after the hood had been re-applied, was due to pus carried up by the absorbents, either directly from the compressed flaps, or from the inflamed part already mentioned, a portion of which was under pressure.

In the amputation of the arm, the same cause was leading to

more serious results, for, instead of taking the form of superficial abscesses, a more alarming train of consequences threatened, if the pressure had not been removed. That persistent vomiting is an evidence of reversed action, and one of its earliest indications, my own observation, and that no doubt of others, has proved. There was therefore good reason to fear from the symptoms that the absorbents in the vicinity of the constricted limb had begun to convey into the system degraded corpuscles, and that the next step in the process would have been the formation of abscesses for their elimination, in some part or organ in which their further progress had been checked. How rapidly the symptoms disappeared, as soon as the hood was removed, the history of the case shews.

It will be observed that the very mischief produced in Mr. Gamgee's case and in mine, and attributed to the pneumatic apparatus, seems, at first sight, to be that for which we should expect M. Maisonneuve's invention to be a preventative—phlebitis, and the formation of abscesses. But it is quite sufficient to give rise to either of these, if we force into the circulation the degraded pus corpuscle, without requiring a septic germ to come in contact with it, and give it its own specific form of disease.

M. Maisonneuve lays great stress on being able to remove by his apparatus "all dead liquids" from the surface of wounds. This I maintain it is impossible to do *in toto*; still it can be done to a much greater extent by leaving no intervening substance between the hood and stump, except the strips of plaster, than if we put layers of lint and bandage as described in his paper, only to get them soaked with discharge, which no amount of suction can entirely remove.

In Mr. Gamgee's case, when the hood was removed, a slight red mark round the limb shewed the line of constriction produced by its margin. In neither of my cases was there any mark, or the slightest difference in the appearance of the skin, either above or beneath the hood. Whether such would have occurred if the latter had remained the same length of time, it is impossible to say. I think not; the hood was larger than Mr. Gamgee's, and the pressure exercised was equable, and no greater at the margin than at any other part enclosed within it, except the very end.

Having thus pointed out the principal objections to M. Maisonneuve's treatment of amputations by pneumatic aspiration, some of which must be unavoidable from the very principle on which the instrument is constructed, I still think there are circumstances in hospital practice under which it can be useful, and ought to be adopted. The following precautions suggest themselves. The hood should be removed at the end of fifty-six hours, by which time, as a rule, the adhesions between the adjacent surfaces ought to be tolerably firm. No other dressing should intervene between the stump and hood than the few strips of plaster. The stump must be carefully cleansed with some antiseptic lotion every time the hood is removed, and exposed as short a time as possible. The hood had better be removed, after the first dressing, every twenty-four hours. The pump should be worked only once in twelve hours, and then not too vigorously. The hood should not be re-applied if persistent vomiting, rigors, or perspirations have set in. Some antiseptic powder should be put in the receiver.

As there are conditions, but little understood as yet, which give rise to the presence of septic germs in the atmosphere of an hospital, and that these do produce, through the medium of a suppurating surface, certain diseases, such as pyæmia, gangrene, and erysipelas, each of which requires its own special germ to produce it, it seems incumbent on us, when they are prevailing in our wards, and we have an amputation to perform, to adopt all means to prevent our patient becoming their victim. M. Maisonneuve's plan, when combined with the use of carbolic acid, offers the best protection against the entrance of noxious germs into a stump, and deserves the fullest trial at our hands.

THE THERAPEUTIC VALUE OF BELLADONNA
IN REFERENCE TO DISEASES OF THE
BLADDER AND URETHRA,

By REGINALD HARRISON, F.R.C.S.,

ASSISTANT SURGEON TO THE ROYAL INFIRMARY, AND LECTURER ON ANATOMY
AT THE SCHOOL OF MEDICINE.

I propose briefly to allude to some advantages I have observed to follow the use of belladonna, local and general, in certain disorders of the genito-urinary system.

As a topical application, I have used it with benefit in some of the more obstinate forms of stricture, especially those consequent on injuries of the urethra.

Referring back, we find some of the surgeons of the last century strongly recommending it, where spasm was present, to produce relaxation; but as we are now provided with remedies more certain in their action for combating this complication, this drug has naturally fallen into disuse.

It is not, however, in reference to any antispasmodic influence it may possess, that I purpose to allude, but to the power which I believe it has of directly influencing and effecting a change in the obstructing material. I was first induced to give it a trial in these cases by observing the benefit that followed its application to cicatrices, and growths of a fibrous character resembling them; in one instance especially, an unsightly deformity on a young woman's forehead, the constant application of the extract of belladonna produced a very decided effect; the cicatrice, though not disappearing, became much softer, more like the healthy skin around it, but what was of still more importance, it lost almost entirely the tendency to contraction which is so

productive of such painful deformities. I have used it with undoubted advantage in other cases, and I therefore had reason for anticipating an equal benefit from its application to such internal cicatrices as gave rise to inconvenience. Of these, the most distressing and obstinate is the stricture following injury to the urethra. It may be dilated, very often, readily, but soon returns, unless constantly under supervision. Dilatation simply *stretches* the cicatrix, without in any way depriving it of that contractile power which is the essence of the disorder.

Some patients may be instructed how to introduce an instrument for themselves, but such a course, for obvious reasons, is not of universal application. Others may be permanently relieved by proceedings of a more strictly operative character, and with comparatively little danger, but from these we find they sometimes shrink. It is to meet such cases that I would suggest the use of belladonna.

The most convenient way of applying it is with the Oleum Theobromæ of the Pharmacopeia, which is sufficiently hard at ordinary temperatures to permit of its ready introduction into the urethra. I generally recommend two grains of the extract of belladonna to be used in this way twice a day, in conjunction with the regular introduction of the metallic bougie in gradually increasing sizes; the belladonna should be persevered in for some time after the bougies have been discontinued.

Very great and, I believe, permanent benefit has resulted from this plan of proceeding, and in cases where the bougie treatment *alone* had previously only effected but very temporary relief. I may also add that my observation is confirmed by others, who have given this plan a trial.

Administered internally, belladonna is one of the most valuable anodynes we possess, and it appears to me to be specially applicable to disorders of the urinary system. In reference to its alkaloid atropine, Dr. Anstie remarks, in the first number of the *Practitioner*, "that it is incomparably the best of all medicinal remedies for every kind of pain in the pelvic viscera. Nothing can approach it in this respect."

The rapidity with which the alkaloid atropia is eliminated from the system is very remarkable. Dr. John Harley, in his *Gulstonian Lectures*, mentions that he had "repeatedly demonstrated the presence of atropia in the urines of different individuals, eighteen, nineteen and twenty minutes after the subcutaneous injection of the forty-eighth and even the ninety-sixth of a grain of sulphate of atropia."

In addition to the general narcotic effects exercised by the drug, the actual presence of the alkaloid in the urine may further explain the benefit following its administration in urinary affections.

The inconveniences attending the use of belladonna are slight, compared with those of opium and other narcotics; the appetite is not interfered with, and, beyond sometimes a little temporary dimness of vision, no cerebral unpleasantness is experienced.

The cases in which the remedy is generally applicable are those which may be classified under the generic term of "irritable bladder." Its use may be advantageously continued, in conjunction with other expedients, for the removal of any exciting causes that may be present, such as the dilatation of strictures, removal of calculi, and other sources of irritation.

There is a form of irritation not infrequently observed, both in males and females, more especially the latter, where there is great irritability, accompanied with the deposition in the urine of large quantities of epithelium. The symptoms sometimes resemble those of calculous disorders, but on introducing a sound, a roughened condition of the lining membrane is alone detected. These almost invariably do well under the influence of belladonna. The nocturnal incontinence observed in delicate children, in nearly all cases the results of a simply irritable bladder and nervous system, do well with small doses of atropine combined with general hygienic measures.

In reference to the mode of administration, I have little to add. I generally prescribe the extract of belladonna in grain doses, once or twice a day, in the form of pills; or the solution of atropine, $\frac{1}{80}$ of a grain to $\frac{1}{16}$, very gradually increased, until

a slight degree of atropism—dryness of the throat, or dimness of vision—is produced. Beyond this it is undesirable to go. Dr. Anstie, whom I have already quoted, speaks very highly of the hypodermic administration of atropine, in the first number of the *Practitioner*. He, at the same time, very properly points out the caution with which the remedy, in this form, should at all times be used.

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MEDICAL AND SURGICAL REPORTS.

1869.

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OCTOBER, MDCCCLXIX.



EDITED BY
P. M. BRAIDWOOD, M.D.,
AND
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ASSISTANT SURGEON TO THE ROYAL INFIRMARY.

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P R E F A C E.

It affords us very great pleasure, in issuing this Third Volume, not only to announce our satisfaction with the increased success which has attended the publication of the Second Volume of these Reports; but also to draw attention to the very various material presented by that portion of this volume which records the Transactions of the Liverpool Medical Institution and of the Northern Medical Society.

We regret the loss, by the removal to another sphere of labour, of Dr. ROBERTS, who so ably assisted in the Editorship of the former Volumes of these Reports.

We trust this Journal will still fulfil its aim of collecting, elaborating, and presenting in an interesting form, the large store of practical and scientific knowledge to be found in Liverpool and its neighbourhood.

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LIVERPOOL

MEDICAL AND SURGICAL REPORTS.

ON CHOREA, GENERAL AND LOCAL.

By THOMAS INMAN, M.D.,

PHYSICIAN TO THE ROYAL INFIRMARY.

THERE are two methods of arriving at a just appreciation of disease; the one consists in an examination of the symptoms presented during life, and, where practicable, an inspection of the body after death; the other is a diligent, and, as far as possible, exhaustive inquiry into its affinities. The first method long reigned supreme in medicine; the second is only now beginning to be recognised. We can readily understand the relative value of the two, if we compare disease to a man who appears before a physician to be examined for life insurance. As an individual, he is perhaps a model of his kind; every organ is in good condition, and the 'life' seems faultless. Nevertheless, a farther inquiry elicits that father and mother both died of phthisis, and that a brother and sister have suffered from the same disease. With this knowledge, the man is appreciated differently to what he would have been without. On the other hand, a man's family history may not have a flaw, and yet he may himself be suffering from the presence of consumption.

Medicine and surgery have for a long time been content to examine the case of disease before them, without inquiry into its family history, and have thus repeatedly misjudged it. To take an illustration, let us regard for a moment the old ideas which

prevailed about acute hydrocephalus. It was supposed to be highly inflammatory, and to require for its treatment active antiphlogistic remedies — purging, bleeding, general, local, or both, with a rigidly low diet; and the practice was persevered in, although systematic writers who endorsed it declared at the same time that it was unsuccessful. After a while, the disease in question was recognised as own brother to phthisis and scrofula, or tuberculosis; and a plan of treatment was inaugurated, allied to that adopted in those complaints. The result has been, that water in the head is now recognised as being, at least, as curable and avoidable as consumption and struma.

In like manner, other diseases have been subjected to a revision of opinion. Amongst them we may notice mania. At one time, it was believed that the fierceness of the onset, the ravings of the patient's tongue, the force of his movements, the perpetual action of his frame, all indicated acute inflammation of the brain. Although *post-mortem* inspection did not support the theory, its value was disregarded; the fact of a comparatively bloodless brain being explained away by its being attributed to *post-mortem* change. Nor did the fact that most maniacs died under the treatment induce physicians to give up the use of the lancet, calomel, antimony, opium, and low diet. Yet the theory of acute madness changed at once, when it was recognised that mania was own brother to starvation, and that it followed in the wake of famine, thirst, overwork, anxiety of mind, and misery.

Again, we may turn our attention to ordinary convulsions. When they were present, the doctor imagined that there must be cerebral excitement; and, as a consequence, many a poor child was treated with leeches. The painful sight was once common of an infant head, white, like wax, crowned with a coronet of leeches, each of which, as it heaved, seemed as if sucking the life-blood away, as indeed it was. But when it was recognised that convulsions were own brother to paralysis, that they came on just before the vital sands had ceased to run, or the heart ceased to beat, that they attended sudden loss of blood, and that a bloodless brain was their most common cause, leeches were recognised as

being pernicious; blood was no more taken, and a restorative plan of treatment was adopted.

Still farther, we may bestow a passing glance upon typhus, and yellow fever. At one time, they were regarded as indicative of exaggerated life-power. The patients seemed to be blazing away, like a huge bonfire in a gale of wind, and, to save the structure, the sticks composing it were carried diligently away. Bleeding, to an heroic extent; tartar emetic; calomel, to salivation; purging and the like were used to reduce the fever; yet the patients died in fearfully large proportions. But when it was recognised that these diseases were induced by poverty, starvation, and exhaustion generally, the practice of the physician altered; and quinine, with appropriate diet, now effects that which the heroic treatment failed to do.

We may fairly apply these remarks to the subject of chorea. Some twenty-seven years ago, I saw a bad case of this disease treated with purgatives, and the patient died. A *post-mortem* inspection revealed no adequate cause of death. Yet the corpse was on the table, and why it was there the most learned pundit present failed in explaining. Two questions were then repeatedly asked,—What is chorea?—Why does it kill? But, for a long period, there was no answer forthcoming. After a time, “the rule of thumb” was used, and the discovery made by the late Dr. Todd, that food and tonics cured St. Vitus’ sooner than low diet and aperients. A farther approximation to a correct pathology was made, when Dr. Alexander Wood, of Edinburgh, called the attention of the profession to the subject of muscular affections generally. In a few words, he demonstrated that the irritability of muscles was in direct proportion to their loss in contractility, *i. e.*, the weaker the organ, the more subject it was to be influenced by irritants. Hence, convulsions and chorea were far more common in delicate children than in sturdy ones. As a corollary, he drew the inference that the best way to cure the two was by trying to make their victims muscularly strong.

With his ideas thus directed, the physician naturally turned to examine the affinities of St. Vitus’ dance. He found it to be allied, on the one hand, to great bodily weakness, and, on the

other, to mental debility. Our memories teem with the almost pathetic descriptions, given by the old masters of our art, of the idiotic mental helplessness which frequently attended chorea. We recollect the stupid gaze of our own patients, their silly laugh, their stupid replies to our questions, or their apparent inability to understand our words. We recognise on their features the report of a tenantless brain, and are sometimes almost tempted to punish our patients for their vacuity and childishness. A sound active mind is very rarely, if ever, found in the chorea which affects children; each not only seems to be, but is, silly.

When we turn our attention to the muscles in chorea, we notice analogous facts. Physically, they are small in bulk, soft, and flabby, resembling wash-leather or bran-poultices, more than firm beef or mutton. If set to work upon something rational, they are unable to perform the duty, but fritter away what little contractile power they have with feeble efforts to do something that they are not required for. But it is not the nervous and locomotive organs alone that are affected; the heart, the stomach, and the bowels are alike implicated. The first is unable to carry on the circulation satisfactorily; the second calls for little food, because it cannot digest much; the third are either sluggish or irritable, and often blown up with wind. The natural inference from all this is, that the whole constitution is impaired for the time, the individual being unable either to feed or work well.

Now we know that a thoroughbred horse, with a good appetite, and strong muscles, has been known to keep on galloping under his rider until both have fallen from fatigue, of which the first dies at once; and we need not multiply instances to prove that excessive muscular labour, *e. g.*, as in swimming, pumping, etc., will kill the strongest men. If so, we cannot feel surprise that the exertion implied in the incessant movements of the limbs in chorea does occasionally end fatally. The cause of dissolution in the case first mentioned is thus explained; the patient was literally "tired to death."

When we still farther endeavour to ascertain the family connections of St. Vitus', we find it allied to palsy on the one hand, and convulsions, perhaps we may add dementia, on the other. We can,

for example, see little, if any, distinct difference between paralysis agitans, the shaking palsy of old age, and the movements of chorea. The jactitations of the last only differ from convulsions in their persistence, and in the absence of unconsciousness. In chorea and dementia, we see many points of resemblance; but we will pay attention chiefly to the most common occasion of the former, and a very frequent cause of the latter, viz., fright. Of all the mental emotions from which animals suffer, none is so powerful as fear. It paralyses the bird in view of the snake; the rabbit is palsied before the boa; the dog, however fierce, is cowed before a naked man in the darkness; and I have known a courageous spaniel die of fright at the close passage of a railway train. Once, in my youth, I experienced the depressing effects of this emotion, and have heard authentic histories of dementia produced by intense fear. The late Dr. Ferguson, and Mr. J. M. Arnott, late of the Middlesex Hospital, both indeed related in their lectures cases, of which they were personally cognisant, in which death could be traced to fear alone. One such case occurred close to where I lived, during the great storm of 1839.

The most common cause of chorea being fright, we can now readily understand that there should be in that complaint both cerebral and bodily debility. Whilst I write, there rises before my memory a scene in the museum of the Vatican. A series of unearthly sounds came upon the air; not shrieks of anguish, cries from pain, or calls for succour, but disjointed utterances, half shout, half scream, half whoop. Distant as they were, I recognised their cause; for the wife of an old friend, who suffered from universal chorea, often uttered the same sounds. All eyes turned wonderingly with my own, and presently we saw a lady, followed by a number of others, running along the gallery we were in, with the gait of a man suffering with shaking palsy, every limb jerking, the head tossed about from side to side, and the windpipe evidently taking part in the irregular movement. All that we could learn was that she was a distinguished Russian lady. Not long ago I read, in one of our monthlies, of a scene in the country of the Czar, in which an individual, at the imminent peril of her own life, saved that of a very distinguished individual. She was

handsomely rewarded; but the writer, who professed to be recording fact, added that the lady was so affected by the danger that she contracted therefrom a disease which would probably remain for life. In my own mind, I associate the story and the scene in the Vatican; but I would not coerce the reader to do so.

Having now ascertained approximately the affinities of Chorea, we ask ourselves, in what way, or upon what plan, the treatment should be conducted. Can we hope for a specific? Clearly not. We have, it is true, medicines which influence the muscles. Conium paralyses them, for example, and strychnine forces them to contract; but neither strengthen their fibre, nor add to their tone. In like manner belladonna, green tea, henbane and opium affect the cerebrum, but none of them enhance its quality. Can we improve a brain already upset by fright, by playing upon a patient's fears, and ordering a shower bath, a birch rod, or any horrible punishment? Clearly not. Fright upon fright is more likely to kill than cure. There being, then, no known specific, we are driven back upon general principles, and endeavour to improve the constitution as a whole, and the muscles in particular.

To fulfil the first indication, we employ unusually generous food, and abundance of it. By such simple means, I have seen a child, wholly unable to sit or stand on Monday, able to walk, sit, or stand comfortably on Friday. Nevertheless, instances like these are rare. Children with chorea do not enter our hospitals usually until they have become far too low to be raised up readily; and they require a long course of rest in bed, tonics, good diet, cod oil, and the like, ere they get well.

To fulfil the second indication, the only means we possess are, shampooing in the first instance, and regulated exercise when the muscular structures begin to regain their firmness. Of the first, the profession has, in my opinion, been too little regardful. Thought highly of by the Greek and Roman doctors, it has fallen into disrepute amongst their British successors, and is generally left to unlicensed practitioners. Yet it is of infinite value, and, when employed in conjunction with medicated unguents, is of

great importance. For example, I have, at the present time, under my care, at the Infirmary, a young woman who has local chorea. Her age is nineteen, and, as to build and general appearance, she seems in robust health. Some years ago, she had general chorea from fright, but recovered perfectly. The present affection, which involves all the muscles of the right upper extremity, shoulder-blade and clavicle, came on gradually, and at length became so severe that she was unable to continue her employment,—that of a milliner. As there was no indication that a general treatment was required, I directed the limb to be shampooed with equal parts of oil and turpentine; but, finding this of no avail, morphia ointment, a grain to the drachm of lard, was substituted, and amendment has steadily followed. The muscles have increased in firmness, and decreased in irritability; but some time will elapse before there is a complete cure.

But it is a question whether what may be called local chorea is ever wholly cured in an adult. In all the cases I have seen, it has been as persistent as the movements in shaking palsy, and all that the doctor can do is to diminish the jactitation to a minimum. We may, indeed, liken this complaint to the nervous tricks contracted by certain men and women, who are able to control them only so long as their minds are not wholly occupied by the circumstances influencing them. As soon as they forget themselves, the nervous trick at once reappears. In like manner, great mental emotion will reproduce or aggravate the local chorea. A lady, before referred to, could, for example, control the choreal spasms of the glottis, whilst with her husband and very intimate friends; but when speaking to strangers, or interested at the concert or opera with exciting music, the windpipe resumed its nervous tricks, and jerked out the most unearthly sounds.

A strange part of the history of local chorea, and a fact which seems to indicate the existence of a cerebral, rather than a local cause, is that, if the shaking limb is fastened to the body by bandages, and compelled to rest, the corresponding member will be affected. When this is the case, it is impossible to predict a recovery. There is not, indeed, any distinct indication for treat-

ment. Blisters to the nape, ears, or temples, bromide or iodide of potassium, opium, etc., may be tried, and may possibly appear successful, but only for a time. Nature may cure these affections, as she sometimes does epilepsy ; but art, I fear, can do little, either to persuade or coerce her to the task.

TRACHEOTOMY IN THE TREATMENT OF CROUP AND DIPHTHERIA.

By P. M. BRAIDWOOD, M.D.

THE science of modern therapeutics consists in a knowledge of the employment of remedies suitable "to obviate the tendency to death." We are unable, even with the *most recent* advances in this department, to define exactly the changes excited in the human economy by the exhibition of medicines. Hence, while endeavouring to rectify the phenomena induced by pathological processes, it is more in our power to prevent their occurrence by altering the conditions which predispose to them. The relation of tracheotomy to croup and diphtheria seems to be of this nature.

Croup and diphtheria, in their milder forms, and in their earlier stages, may be regarded and treated as local affections, as forms of inflammatory irritation of the upper part of the air passages; but, after passing this boundary line, they become constitutional affections, and exhibit the ordinary phenomena of blood diseases.

It has long been admitted that in febrile affections there is increased viscosity of the blood. More recently, it has been stated that, in this class of diseases, there is exhibited a morbid irritability of the colourless blood corpuscles. But to neither of these conditions can the fatality which attends severe cases of croup and diphtheria be attributed. The more immediate cause appears to be an altered gaseous constitution of the blood, due perhaps to imperfect oxygenation, perhaps to increased carbonisation, or to the presence of some foreign gaseous fluid.

In the treatment of the earlier stages, and of mild attacks of croup and diphtheria, there is considerable uniformity of opinion; but great difference of opinion still prevails regarding the treat-

ment of these diseases when they exhibit a very grave aspect. In the former class of cases, the use of diaphoretics, and of saline purgatives to relieve pyrexia, of expectorants and emetics to remove false membrane, and of moisture, in the form of diluents and of moist air, is found to be sufficient to combat the disease. When, however, all such remedies have been employed, when the practitioner has anxiously ransacked the Pharmacopœia, and the disease still progresses, he is forced to reflect more intensely on the probable cause of this serious condition, and to search for a possible means of relief.

Cases like the following illustrate the rapidly fatal and seemingly intractable nature of croup and diphtheria. A child, 8 years old, was brought to hospital forty-eight hours after she took ill. She exhibited the ordinary symptoms of croup, accompanied by bronchitis. Respiration was embarrassed, and at times extremely difficult. I performed tracheotomy, which relieved the symptoms; but about sixty hours after the operation, she had a spasmodic attack, which was fatal.

Again, a boy, aged 4 years, was admitted into hospital with the usual symptoms of diphtheria. He looked very well, and breathed with ease, except when asleep. Next day he was decidedly worse, and had several attacks of embarrassed respiration. In the evening he breathed with much difficulty, and had slight lividity of the face. I performed tracheotomy, which afforded relief; but the patient's strength gradually failed, and he died, about forty-eight hours after the operation, from asthenia.

How is it that these diseases are so rapidly fatal? One chief cause is evidently impeded respiration, and the consequent imperfect aeration of the blood. These are the precursors, probably the inducers, of death, and they lead to a further pathological process, viz., a morbid alteration of the constitution of the blood. This is proved by the enlarged cervical lymphatic glands, which are found after death to encroach on the surrounding parts. This complication is described by Dr. Aitken, thus:—"The lymphatic glands to which the lymphatics of the pharynx lead are found in cases of diphtheria to be larger, redder, and moister than natural,

and if the disease has continued long, they become brittle, pale, and of a brightish red colour on section—characteristic of inflammation of their substance.” I have always met with this enlarged state of the cervical lymphatic glands in cases of croup and diphtheria when I examined the parts carefully. Sometimes these organs become so swollen as to meet in the mesial line in front, and they may thus render the operation of tracheotomy difficult. Paralysis of deglutition, which forms one of the most serious complications in such cases, is due, I think, most frequently to this mechanical pressure on one or both recurrent laryngeal nerves.

It appears reasonable, then, to suppose that tracheotomy, by relieving respiration and thus promoting sanguification, is an important aid in the treatment of croup and diphtheria. Moreover, by thus dealing with the important function of blood formation, this operation prevents the swelling of the cervical glands mentioned already. It is my firm conviction that, in the aggravated forms of these diseases, treatment should consist not alone of means which relieve symptoms, but of those which prevent the serious changes resulting from impeded respiration. The altered constitution of the blood arising from the difficult breathing causes the retention of certain impurities, as is shown by the frequent occurrence of albuminuria along with diphtheria. Dr. Sanderson is of opinion, that the albuminuria in such instances “is due to the morbid condition of the blood induced by the fever miasm.” Tracheotomy, then, by allowing more easy and free aeration of the blood is a most important adjuvant in the treatment of croup and diphtheria.

The happy issue of the following case confirmed this opinion, and led to the inferences which shall be hereafter specified. A girl, aged 6 years, complained of the ordinary symptoms of cold, with sore throat, about a week before her admission into hospital; while four days later her voice became very hoarse and her respiration difficult. On admission, her pulse was 140, and weak; inspiration was accompanied by the characteristic croupy sound; and on examining her throat, the two tonsils and the uvula were seen to be covered with diphtheritic membrane. The throat was

diligently fomented, and nourishing food with wine was given in small quantities at short intervals. About four hours after admission, she had a very severe attack of coughing, breathing was laboured (all the respiratory muscles being used during inspiration), and her lips and face were somewhat livid. I performed tracheotomy, and this gave relief. The patient then had a tranquil sleep, which she had not had during the previous forty-eight hours. She improved during the two following days, and her strength was supported by drinking milk. Her pulse was 180. She expectorated no membrane. At this time, however, she complained of difficulty of swallowing; accordingly, while her mouth was kept moist by giving very small draughts of milk, she was chiefly supported by enemata of beef-tea and wine, administered every three or four hours. Poultices were also applied over the throat, and she sucked occasionally a brush dipped in Condyl's fluid well diluted. She had slight bronchitis. Convalescence was uninterrupted. The enemata were continued till all difficulty in swallowing disappeared. The tube was finally removed from the trachea in a fortnight after the operation. The wound healed up in a few days afterwards, and the patient went out quite well, after having been in hospital three weeks.

The points in the treatment of this successful case, which deserve attention, are,—the facility of respiration afforded by tracheotomy, and the support of the system by nourishing food, while the diseased parts were kept at almost perfect rest.

While strongly recommending tracheotomy in the treatment of croup and diphtheria, the *time* at which its performance is likely to be advantageous should not be overlooked. It need scarcely be stated that in mild attacks of these diseases, and in cases which present *no* signs of imperfect oxygenation of the blood, this operation is not required; but the large mortality which attends severe cases of croup and diphtheria, even after tracheotomy, will be found most commonly to be owing to this operation having been performed too late. Tracheotomy is generally regarded as a last resource in the treatment of these affections; and as long as this view is held, the results of this operation will be far from satisfactory. Of what advantage can

it possibly be to render respiration easy, to remove the impediment to free oxygenation of the blood, some hours, or even days, after the whole of the patient's blood has become so thoroughly deteriorated as to cause spasmodic attacks of coughing, to excite enlargement of the lymphatic glands, so that they cannot perform their functions properly, and to affect the nervous system as indicated by paralysis—while the patient's strength at the same time is failing? Tracheotomy may prevent, but it cannot amend, this state of matters when fairly established. The trachea should be opened *early* if any benefit is to be looked for from the operation. In all instances relief is afforded by the operation; and, as in the hands of most surgeons, such cases die in spite of its performance, the opinion still prevails that tracheotomy is of use only in allowing the patient to slip smoothly away, instead of dying asphyxiated.

The difficulty lies in choosing the right moment, the early and suitable opportunity, for performing tracheotomy. When the symptoms of impeded respiration and imperfect sanguification are exhibited, the operation should not be delayed. When inspiration is laboured, when all the respiratory muscles seem to be employed in the act of breathing, and when, with reddened face covered by sweat, the patient tosses from side to side, clutching and gasping as if seeking everywhere for help, no time should be lost. A few hours later the symptoms of asphyxia are exhibited, and then the chances of recovery, even with a free access of air through an artificial opening in the trachea, are very slight indeed. One must not, however, wait in *all* instances till these signs of embarrassed respiration become fully developed; discretion must guide us. Better too early than too late.

As to the secondary affections which may follow tracheotomy, and as to the difficulties which may attend its performance;—the complications met with in this operation are pneumonia and bronchitis. The latter is comparatively seldom met with after tracheotomy, but it is a more common complication than pneumonia. It is easily guarded against by keeping the patient in a warm room, the air of which is moistened by steam; and it is best treated by applying poultices over the chest. In my experience, however,

death after the performance of tracheotomy for croup and diphtheria (except where the virulence of the disease cuts off the patient) is most generally to be ascribed to careless nursing. In such instances it is caused, either by the plugging up of the tube with mucus or false membrane, or the child being allowed to sink from want of sufficient nourishment.

The operation itself is of easy performance, and may be said to be uncomplicated; but much of its success depends upon the subsequent nursing of the patient. It is most important in the treatment of such cases to pay attention to the following points:—to keep the tube pervious by passing a feather frequently through it, to moisten the mouth and throat with small quantities of fluid food, given frequently, and to support the patient's strength by nutritive enemata when deglutition is painful.

In the next place, as to the exhibition of chloroform during the performance of tracheotomy, and as to the arrestment of hæmorrhage during the operation. It is of the utmost importance that tracheotomy should never be performed in a hurry. If this operation is to be of service in the class of cases we have been considering, it can only be useful in a comparatively early stage of the disease; and it is quite useless to thrust a knife hurriedly into the trachea when the child is unconscious and livid. There should be no unnecessary haste shown in the performance of the operation; and, if so, why not relieve pain by giving chloroform? Chloroform does not render the condition of the patient any worse as regards the constitutional affection, and it assists the surgeon greatly by keeping the patient quiet. One further advantage I have found to result from the exhibition of chloroform is, that the child by this means is forcibly sent to sleep, and receives refreshing rest, which he has not had for some days previously. This artificially induced sleep is very often followed, after some food has been taken, by a natural slumber.

It is a debatable question, whether or not time should be spent during the performance of tracheotomy in arresting hæmorrhage. Such bleeding is, for the most part, venous, and is formidable in consequence of the dilated condition of the cervical veins. When the trachea is opened, this excessive engorgement at once

subsides; and it will commonly be found that the hæmorrhage ceases. Professor Trousseau, however, states that he has seen death caused by blood passing into the trachea during the operation, and he strongly urges the *complete* arrestment of the bleeding before the trachea is opened.

In conclusion, the following table of cases of tracheotomy, performed for the relief of croup and diphtheria, and derived from very various sources, furnishes strong evidence in favour of this operation, even in some of the severest forms of those diseases. This table refers to the experience of surgeons in private practice, and to the results of such cases treated in hospitals. The total numbers show the proportion of three recoveries in every eight cases.

Table of Cases of Tracheotomy for Croup and Diphtheria.

Authors.	Total of Class.		Number of Recoveries.
Prof. Spence, Edinburgh	-	87	- 28
Dr. G. Buchanan,* Glasgow	-	31	- 11
Prof. Roser, Germany	-	42	- 19
Dr. Jaffé, do.	-	294	- 65
Dr. Barthez, Paris	-	142	- 110
Dr. Voss, America	-	14	- 5
Dr. Fock, Germany	-	24	- 10
Dr. Isnard, France	-	4	- 2
Dr. A. Jacobi	-	62	- 13
Prof. Steiner	-	52	- 18
M. Baizeau, Paris	-	12	- 4
Prof. Titanus, Amsterdam	-	80	- 28
M. Archambaud	-	62	- 22
M. Bourdillat	-	16	- 10
Total	-	922	- 345

* "During the last seven years I have been called to upwards of 40 cases of croup and diphtheria, as a consulting surgeon. In 31 of these cases I performed tracheotomy, and of these 11 recovered perfectly. The cases I refused to operate on were either *in articulo mortis*, or were in a stage, when

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I saw them, when there was apparent hope of recovery by perseverance in medical treatment. But what is remarkable is, that of the whole none recovered except the 11 saved by tracheotomy. And it is this consideration which has determined me to undertake the operation in the future, even earlier in the stage of the disease than I have previously ventured," etc.—
From *Transactions of St. Andrew's Medical Association*, vol. i., p. 161, 1868.

A CASE WHERE THE DESCENDING COLON WAS
OPENED SUCCESSFULLY FOR VESICO-INTESTINAL
FISTULA,

By JAMES HAKES, M.R.C.S.,

SURGEON TO THE ROYAL INFIRMARY.

THOMAS F., aged 20, a puny-looking lad, was admitted into the Royal Infirmary in the month of March, 1869. His history was as follows.

Five years ago, he received a kick behind. This was followed by swelling about the anus, which gradually subsided, without inconveniencing him further.

Three years ago, he experienced some difficulty in passing fœces, which gradually increased, up to twelve months ago, when he noticed some discharge from the rectum, and that fœcal matter passed in small quantities by the urethra. During the last twelve months, his condition has gradually become worse. His state on admission was as follows. He had a very care-worn appearance, and was much emaciated. Fœces, in considerable quantity, were mixed with the urine, and flowed from the urethra. This, together with the passage of flatus into the bladder, was productive of most excruciating pain. Urine, with fœces, also passed from the rectum. On introducing the finger into the rectum, a constriction could just be felt, and beyond it a ragged ulcerous surface, which doubtless was the point where the communication with the bladder commenced. On an examination with a speculum, the mucous membrane of the rectum was observed to be in a very unhealthy condition. A sound introduced into the bladder could be passed into the rectum. No other plan of treatment suggested itself than that of opening the descending colon, the communication between

the bladder and the bowel being evidently so extensive, and so far removed, as not to permit of any attempts at remedying it by a plastic operation. By opening the bowel, and forming an artificial anus above the point of communication with the bladder, it was hoped that the fistulous communication would contract. At all events, the operation held out an almost certain hope of alleviating the more distressing features of the case, and the pain attendant upon the passage of a large quantity of both fœces and flatus into the bladder.

The nature of the disease was somewhat doubtful.

It was clearly not malignant; and it was very questionable whether the injury received five years previously had anything to do with the disease, which did not manifest itself until two years subsequently. There were no symptoms of constitutional syphilis, or any history of the patient having suffered from dysentery. The ulceration was of a very unhealthy nature, and of the character often observed in strumo-syphilitic subjects.

On March 30th, 1869, the descending colon was opened. As the space between the last rib and the crest of the ileum was unusually small, the operation was not concluded without some difficulty. The incision commenced at the outer edge of the erector spinæ, and was carried outwards, and slightly downwards, to the extent of about four inches. There was hardly any hæmorrhage. Some difficulty was experienced in finding the bowel, as it was quite contracted, and embedded in sub-peritoneal fat and cellular tissue. The gut, on being opened, permitted the escape of some thin fæculent matter. The cut edges of the intestine were fastened to the wound by several silver sutures.

After the operation, the patient was threatened with an attack of peritonitis, which, however, subsided under treatment. Fœces at once commenced to flow through the wound, and the distressing symptoms already alluded to were most speedily mitigated.

August 7, 1869, rather more than four months after the operation, the patient's condition is as follows.

He has certainly gained flesh, and has a much more healthy and natural appearance. He takes his food well, and is quite free from all those distressing and painful sensations which have

already been described. His general health and condition have vastly improved since the operation.

The fœces all flow through the artificial anus. The urine is perfectly clear and normal, and is almost all naturally passed by the urethra, a small quantity passing by the rectum.

Further comment on the case is hardly necessary. The only plan that could be adopted has quite fulfilled the hopes that were entertained, and has placed the unfortunate patient in a position of comparative comfort.

An abstract of a case, where the operation was performed under somewhat similar circumstances, recorded by Mr. Harrison, will be found in another part of this volume, amongst the "Proceedings of the Liverpool Medical Institution."

CASES OF TRACHEOTOMY,
WITH REMARKS,
By T. GULSTON WOLLASTON, M.D.,
SURGEON TO THE SOUTHERN HOSPITAL.

THE following cases of tracheotomy have recently occurred in my practice at the Southern Hospital, and I trust that the readers of the *Liverpool Medical and Surgical Reports* will agree with me in considering a condensed report of them worthy a place in that journal.

In the two first cases, the operation was performed for the relief of symptoms due to what I believe to have been syphilitic disease of the larynx, although, in the case of J. E., the patient attributes his illness to a cold contracted during a long stay at the wheel, in wet clothes, while crossing the line, about a year ago. The second case, that of J. F., was purely a syphilitic affection.

In both instances, the operation had to be repeated after an interval of a few months only, in consequence, apparently, of a return of symptoms due, possibly, to the same disease.

J. E., aged 44, a Swedish seaman, was admitted into the Hospital on June 5th, 1868. At the age of 29, fifteen years ago, had a chancre on the upper surface of the prepuce, which yielded to the application of sulphate of copper, in the course of a fortnight. He neither took mercury nor medicine of any kind. Just as the sore was healing, a bubo made its appearance in the right groin; and this, as well as a subsequent one on the opposite side, ran an ordinary course. Nine years ago, had an attack of gonorrhœa, for which he appears to have taken no medicine whatever, and which lasted some three months. Eighteen months ago, had an attack of what he was told was pleurisy. With these

exceptions, states he has always been a healthy man. Says he never had a skin eruption; but this is doubtful. Twelve months ago, had an attack of sore throat, which has continued more or less ever since, being latterly accompanied by difficulty of breathing, and much hoarseness, and cough.

I saw him on admission. He was then almost pulseless, very livid, and only giving an occasional gasp. As there was no time to lose, I at once plunged a scalpel into his trachea, when, a few artificial respiratory movements being made (the opening in the trachea being meanwhile held open with a pair of dressing forceps), breathing was restored. After all bleeding had ceased, and a small quantity of blood, which had been sucked in with the first few inspirations, had been coughed up, an ordinary double tube was easily inserted into the somewhat large wound in the trachea. On examining the throat, several ulcers are seen on the fauces and soft palate; with the aid of the laryngoscope, the upper portion of the glottis is found to be thickened and highly vascular, and a well-marked syphilitic ulcer exists on the left cheek, with sundry patches of copper-coloured psoriasis on the arms and chest. The patient was placed on a liberal diet, and gr. $\frac{1}{8}$ of hydr. perchlor. with decoct. sarsæ. co., administered thrice daily. Under this treatment he rapidly improved, the ulcer on the face healed, the eruption disappeared, the laryngeal symptoms abated, the voice became stronger and clearer, and air in considerable quantities entered the chest by the natural passage, the only drawback being occasional attacks of dyspnoea, due to the separation of portions of the tracheal rings, to facilitate the expulsion of which it was at times necessary to remove the tube with as little delay as possible.

As he was unwilling to have the tube removed altogether, he was ordered to keep the orifice closed with a cork during a portion of the day.

In March, 1869, he was re-admitted, suffering from an attack of pleurisy on the right side. He had been employed as a rigger, and consequently greatly exposed to cold and wind. The voice was almost as good as ever it was, and the breathing perfect, but still he felt unwilling to part with the tube.

In the end of April, when the pleuritic attack had passed off, the tube was removed for a short time, and, on an attempt being made to re-introduce it, this was found to be impossible, on account of the rapidity with which the orifice had closed.

During the month of May he continued well, the voice having almost regained its accustomed strength and clearness; but, on careful examination, the air appeared to be entering the chest through a somewhat constricted trachea.

The following month, the old laryngeal symptoms made their appearance, and, on the 21st of June, it was found necessary to re-insert the tube, which he has continued to wear ever since.

Now this appears to have been a secondary syphilitic affection, following a soft or non-infecting chancre, accompanied also by suppurating bubo; for one can scarcely imagine a true Hunterian chancre yielding to the local application of sulphate of copper in a fortnight. Truly, I may be met with the argument, But the attack nine years ago, which he calls gonorrhœa, was in reality a case of indurated Hunterian chancre in the urethra; and this I am disposed to think was the case.

The second case is one of a purely syphilitic nature. J. F., aged 47, seaman, had a chancre fifteen years ago; says it felt hard and bony to the touch; took mercury to ptyalism, and was well in two months; had no suppuration in the groin, but says the glands were enlarged and tender. Ten years ago, had gonorrhœa and soft chancres; was treated with mercury, and recovered in six weeks. Four years ago, had sore throat and syphilitic rheumatism; treated at sea with iodide of potassium, and soon recovered.

On admission, September 5th, 1868, he was suffering from sundry ulcers on the face and lips; much huskiness of voice, and difficulty of breathing, accompanied by frequent attacks of spasmodic cough. There was also considerable ulceration of the throat, but no skin eruption. He was placed upon the biniodide of mercury, and fumigations to the throat. With this treatment, the ulcers quickly improved, but fresh ones appeared over the nasal bones, and these ultimately necrosed, and were removed. Meanwhile, the laryngeal symptoms became aggravated, and it was found necessary to introduce a tube into the trachea, early in

October. This was retained for three months, and then removed, as the laryngeal disease appeared to have subsided.

In April, 1869, he was re-admitted, suffering from a return of the old symptoms, and a well-marked indurated sore at the corner of the mouth. The perchloride of mercury with sarsaparilla was administered with benefit for a time, but yet the laryngeal symptoms did not yield, and, at his urgent request, the operation was repeated on May 23rd. He was discharged, wearing the tube, July 10th.

In this case, like the last, much inconvenience was experienced from necrosis of the tracheal rings, giving rise, until their expulsion could be effected, to severe and sudden attacks of dyspnoea.

T. C., aged 7 years, admitted March 9th. The friends stated that, a few minutes previous to admission, he was at play in his usual health, when, without the least warning, he fell to the ground in a state of suffocation. As death was imminent, I at once proceeded to perform tracheotomy, which was rendered extremely difficult, owing to the patient's struggles, and the great depth of the trachea. The opening in the air tube was made large, as I considered, from the history of the case, that the symptoms were probably due to the presence of a foreign body, although I could not ascertain that the lad had anything in his mouth at the time of the attack. Nothing, however, could be detected on careful examination, so an ordinary double tube was introduced, and the boy placed under the influence of opium. The operation was followed by most acute tracheitis, necessitating the cleaning of the tube every two hours. The discharge was purulent, and not at all resembling the membranous exudation of true croup. For many days the boy's life hung on a thread. Deglutition was so difficult and painful that the patient refused all nourishment, and had to be kept alive by means of brandy and beef-tea injections by the rectum; and I would embrace this opportunity of thanking Mr. Davies, the house-surgeon, for his constant and unremitting exertions, both by night and day, which conduced so much to the successful result.

On March 27th, the tube was removed; by the 29th, the wound had completely healed; and on May 22nd he was discharged cured,

Considerable hoarseness existed for some time ; but, at the present date, the voice has almost regained its former strength and clearness. Still, I believe there remains some amount of narrowing of the trachea, due probably to the excessive inflammation following the operation.

Judging from the suddenness of the attack, and the absence of any precursive symptoms, I am inclined to look upon this case as one to which Dr. Mason Good has given the name *laryngismus stridulus*.

The fourth and last case to which I shall allude, is one in which the operation was performed for the relief of true croup.

M. O'D., aged 7 months, was admitted on June 24th, croupy symptoms having existed for some days previously. As the case was one of great urgency, tracheotomy was immediately performed by Mr. Davies, the house-surgeon, and a good sized child's tube introduced. Instant relief was experienced, the child at once taking the breast freely. False membrane was discharged, at first in considerable quantities, until July 2nd, but the tube could not safely be removed until July 18th. On the 20th, the mother removed the child, contrary to advice, as she considered her quite well. Three days later, on the 23rd, the day being an extremely wet one, the infant was taken to a distant part of the town, and, in the evening, a slight return of the symptoms appeared. The mother left it in the hospital for the night, but removed it, at her own request, the following morning, as the little thing was somewhat better. On July 26th, she again brought the child to the out-patient department, still, however, unwilling to permit its re-admission as an in-patient. Although the breathing was not very oppressed, the patient was evidently sinking from extension of the disease, and we heard that death took place on the 29th. One can but regret the excessive stupidity of the mother, as, had she consented to the child's re-admission on the 23rd, its life might possibly have been saved.

In disease of the larynx, depending on a syphilitic taint, if the symptoms do not yield to treatment in a short time, the sooner the organ is rendered perfectly quiescent the better ; for we shall find that mercury, and other remedies that before scarcely acted at all, now most readily respond to our wishes.

In operating in cases in which it is necessary that the tube should be worn for a length of time, where we wish to place the larynx in as perfect a state of rest as possible, it is desirable that the opening in the trachea should be as small as is compatible with circumstances; for, if we divide too many of the rings, we give undue play to the tube, during the act of deglutition, etc., and thus set up a source of inflammatory action, leading to the formation of matter between the cartilage and its investing membrane, resulting in the rapid death of the former, and the subsequent inconvenience and danger arising from its expulsion.

In chronic disease, I would urge *early* operative interference; for, by so doing, we place the organ in a far better state for recovery, and avoid all risk of sudden death from oedema, spasm, etc., a result I have seen occur in more instances than one, and in cases, too, in which the patients appeared to be improving under the treatment employed. This remark applies also to croup and diphtheria, for, although my experience is small, extending only to some half dozen cases, and the results have been extremely unsatisfactory, I believe that, had the friends consented to the operation at an early stage of the disease, the chances of a successful issue would have been much greater.

I would add a word with regard to the form of tube to be employed. The ordinary round double instrument, perforated on its upper surface, is much to be preferred, and introduction is greatly facilitated by the incision in the trachea being kept open with a pair of Weiss' "wound forceps." The "spring tube," the outer one of which is split, is very pretty in theory, but in practice we shall find that, when the finger and thumb are applied behind the shield, in order to compress the blades, the instrument is not of sufficient length to reach the trachea, especially in children.

In the after-treatment, when the tube has been removed for the purpose of cleaning, etc., its re-introduction is much assisted by passing it over a bent probe; and, for the removal of discharge, an ordinary pipe brush will be found to answer best.

CASE OF MOLLITIES OSSIUM,

BY JAMES TURNBULL, M.D.,

PHYSICIAN TO THE LIVERPOOL ROYAL INFIRMARY.

THE following well-marked case was admitted into the Infirmary on the 26th of December, 1868, and is still detained there in consequence of a fracture of the thigh. The patient had improved very greatly, and had begun to sit up, and even use crutches, when he had, on the 15th of May, a fall which proved the fragile condition of the bones by the thigh bone being fractured in the upper third. By similar slight accidents, the other thigh had been fractured six years previous, and the right humerus two years previous.

Mollities ossium, or osteomalacia, is a rare and curious disease, which closely resembles rickets in some of its prominent features, but yet is in reality essentially a different disease. They both arise from perverted nutrition; but mollities ossium is a degeneration of the bony tissues, whilst rickets is the result of arrested development in childhood, unattended with pain, and can generally be remedied. The degeneration in mollities ossium is accompanied with separation of the inorganic from the organic constituents of the bones, and the relative quantity of the earthy matters is diminished. The affected bones are not only fragile, but so soft that they may be readily cut, and the section presents the appearance of a reddish soft gelatinous or greasy matter.

Little seems to be known of the cause of this disease, beyond the fact that many of those who have been affected appear to have suffered from privations, anxiety from precarious means of existence, cold and damp; but others have suffered from none of these influences.

Mollities ossium is much more common in females than in

males; and Mr. Durham has shown, in a paper in *Guy's Hospital Reports*,* from an analysis of 145 collected cases, that only 18 were males, and 132 were females. The disease would also seem to be connected with child-bearing, for 91 of the females were first affected during pregnancy, or soon after child-birth. He has also shown that the great majority, both of males and females, began to suffer when between the ages of 25 and 35.

Pain seems to be the earliest symptom of the disease, and it is of a peculiar deep-seated character, as if in the heart of the bones, being also increased by motion, and by pressure on the affected parts. It has, however, been often mistaken for rheumatic pain, in the early stage; but, as the disease advances, the bones bend under the contracting power of the muscles, and the patient becomes a sad distorted cripple, and liable to have his bones broken from the slightest injury.

Though the disease may be arrested and delayed in its progress, the prognosis is very unfavourable; and, in some cases, death has taken place from asphyxia, the patient having become unable to inflate the lungs, owing to the soft and yielding condition of the ribs.

The treatment should be essentially tonic, and should be directed to the improvement of the nutritive functions. There was a very marked change for the better in the condition of this patient under such treatment. He took cod liver oil, and also a tonic mixture, with phosphate of iron and phosphoric acid, and also some phosphate of lime. It is doubtful, however, if phosphate of lime could be of any service, for there was from the first an excess of phosphates in the urine, so that, in this as in other cases of mollities ossium, it would seem that there must have been a want of power to assimilate the phosphate, rather than a deficiency of it in the system.

Joseph Sharp, an intelligent little man, 32 years of age, was admitted under my care on the 26th December, 1868. He had been always rather delicate, and, before his illness, was only five feet nine inches in height. His father brought him up as a vege-

* 1863-64.

tarian between the age of 15 and 18, and when 20 he had small-pox, which weakened him so much that he afterwards walked with the assistance of a stick. He had been in business as a shoe manufacturer, but had latterly been only a clerk. He began to have pains in the limbs about seven years ago, and about two years before admission his bones began to bend. The pains, which were deep-seated, commenced in the lower extremities; but the fore arms were the first to bend. He fractured the right thigh six years ago, from slipping on orange peel; and he had also a fracture of the right humerus, from a fall, two years before admission. When admitted, he was thin, weak, and pallid, and so helpless that, for many weeks after, he was unable to raise himself in bed. The fore arms were very much curved, and the bones painful on pressure and motion. The lower extremities were twisted and deformed, the left clavicle bent; the spine had sunk down, inclining forwards, and, in consequence of this, the ribs were in contact with the crest of the ilium on both sides. He had also lost about five inches of his original height. He had lost all his teeth, which had dropped out. The functions were natural, except that digestion was weak, and he had been troubled with heartburn and acidity. He improved greatly with good diet, and the warmth and nursing of the Infirmary. He got fat with this, and the phosphate of iron and cod liver oil treatment, and his strength increased, so that he began to use crutches, when he had the misfortune to fall, on the 15th of May, fracturing the thigh. He has, however, maintained his ground fairly, notwithstanding, and the fracture has united. The urine was examined by Mr. Brown, Lecturer on Chemistry at the School of Medicine, when the patient was admitted, and his report on it is as follows:—

The first specimen examined was turbid; the deposit consisted of urates and phosphates, and the urine also contained excess of phosphates in solution.

The second specimen, passed a week later, was clear and acid; of specific gravity 1020. It also contained a large quantity of phosphates.

In both samples, nitric acid developed a red colour, and they

were accordingly compared with the remarkable case detailed by Dr. H. Bence Jones (*Phil. Trans.*, 1848, p. 55). In that case, the urine contained an albuminoid substance, which rendered the fluid opaque when boiled. When nitric acid was added, and heat applied, the urine became clear, but it *solidified on cooling*. The substance was precipitated by ferrocyanide of potash, and somewhat resembled gelatine, but still more the teroxide of protein obtained by the action of chlorine upon albumen. Dr. Jones had a suspicion of chlorine in the urine; and he named the substance "deutoxide of albumen."

The urine contained a sediment of phosphates and of oxalate of lime.

In the present case, several samples of urine were examined, but did not yield any albuminous substance. Two samples were examined very carefully for chlorine, and did not contain a trace.

In Dr. Jones's case, which was acute, the mineral salts of bone, and also an organic substance, were passed in the urine.* In the present case, the mineral salts of bone are found in the urine in excess, while the organic matter does not appear to be passed entire, although it may be removed, as urea and other products produced by oxidation in the ordinary process of disintegration of albuminous tissues.

* The name "deutoxide of albumen" must not be understood to indicate a basic substance of definite composition, analogous to oxide of iron, or the like. Chemical substances are characterised by constancy of composition, amidst change of shape. Organised substances are of indefinite composition and of definite form. Albuminous substances are on the debatable border-land between the two classes. They all contain a complex compound of carbon, hydrogen, nitrogen, and oxygen, with a little sulphur and phosphorus, and this is generally loosely united with various salts. In the substance called deutoxide of albumen, an extra proportion of oxygen is associated in some unknown manner with the other elements.

ON RUPTURE OF THE UTERUS,

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Of all the dangerous complications that may arise, during a case of parturition, there is no one fraught with more serious consequences to the patient, and more painful anxiety to the accoucheur, than rupture of the uterus. Its generally sudden occurrence in the course of a labour which has appeared to be going on satisfactorily, if slowly; the frightful rapidity with which the fatal results of the accident become manifested, and the ignorant excitement of the friends of the patient, often leading them to accuse the attendant surgeon or midwife of ignorance or negligence, altogether throw upon the medical man in attendance an amount of anxiety and responsibility which will severely test his discretion, his fortitude, and his self-possession.

The frequency of cases occurring, in which medical men are unjustly prejudiced by such accidents, makes it a matter of interest to enquire, firstly, whether there are any circumstances which may lead us to apprehend that a rupture of the uterus may take place in any given case; secondly, whether any particular line of treatment can be adopted in such a case, so as to reduce the danger of rupture to a minimum. With this view, I will now give the details of five cases which have occurred at different times in my practice, and conclude with a few practical hints derived from the experience of these cases.

CASE 1.—S. W., *setat* 25. This was her second confinement. She was affected with secondary syphilis severely. Had external

sores about the vulva. She was attended by a midwife, who stated that, after having tedious labour all night, the pains suddenly ceased early in the morning. She then began to sink, and never rallied. When I got to the house, she was no longer living.

Post-mortem examination. On opening the abdomen, the back of the child came at once into view, as it lay there displacing the bowels. There was a wide rent in the uterus, on its anterior surface, near the junction of the body with the cervix. Through this rent the child had passed. For two or three inches on either side of the rent the uterus was thin and soft. The edges of the rent were not more than a quarter of an inch in thickness. I believe that in this case the degeneracy and atrophy of the uterine fibre was a consequence of the syphilitic condition.

CASE 2.—M. A. R., *ætat* 42. This was the eleventh confinement. It was a breech presentation. The os was fully dilated, and the breech rested on the brim of the pelvis. This lasted for four hours. Uterine action regular, but the pains feeble and ineffective. I then drew down the right leg, by hooking a finger in the groin. Very little force was used; but, as the knee bent down, it pressed a little against the uterus. The labour was then over in about half an hour, and she seemed tolerably comfortable; but, in about half an hour more, she became very uneasy, was restless, complained of pain in the abdomen, and sank rapidly, dying four hours and a half after delivery. There was no hæmorrhage externally, and the uterus was contracted throughout.

Post-mortem examination. There was nearly a pint of effused blood in the cavity of the peritoneum, and a tear in the uterus nearly two inches long, through the peritoneal coat, and about half way through the muscular coat, but not extending into the uterine cavity. This rupture was near the cervix, and the seat of it seemed to me to correspond with the part where the knee of the child pressed against the uterus, as it was being drawn down. The whole of the tissue of the uterus seemed morbidly soft, flabby, and pale, and appeared to be affected with fatty degeneration.

CASE 3.—E. H., *ætat* 27. Her second confinement. She had

had a very tedious labour on the occasion of her first confinement. For several months previous to her second confinement, she suffered from cough, dyspepsia, and debility, and was altogether in bad health. I was asked to see her on a Friday evening, at 11 p. m. I found her in a state of extreme collapse; no labour pains, but a feeling of distension and extreme soreness of the belly, with great anxiety; extreme pallor, pulse very feeble, and almost too quick to be counted. I felt certain that rupture had taken place. She died in about twenty minutes. The history given by the friends and the midwife was confused and unsatisfactory. She had been ill from the Wednesday morning previous, but her pains had been feeble and irregular. She had been taken very much worse early on the Friday morning, but it was only when a further change had taken place that they thought it necessary to apply for medical assistance. On this account I could not satisfy myself as to when the rupture had taken place.

Post-mortem examination. As in Case 1, the child was found lying in the abdomen, with a great rent in front of the uterus. The substance of this organ was flabby and degenerate, but not particularly thin.

CASE 4.—C. F., *ætat* 37. Her seventh confinement. This was a cross-birth. She had been ill all night, a midwife being with her. The water had been dribbling away for several days, but there had been no pains until this night. At 3 a. m., the midwife found an arm presenting, and then sent for a doctor. This gentleman, finding the case a difficult one, sent for another, who thought evisceration would be required. At 8 a. m., I was requested to see the patient, and render assistance. On examination, I found the right arm presenting, with the shoulder and shoulder-blade pressed down into the pelvis, the brim rather small for the size of the child, and the child pressed tightly against it, the patient not being sensible of strong pains, but the uterus being contracted on the child by a sort of tonic spasm. With some difficulty, I passed my hand up as far as the child's abdomen (the patient being fully under the influence of chloroform), but I could not reach the feet, the uterus being pressed tightly against

my hand. I made no further effort to turn, but proceeded at once to eviscerate, perforating in the axilla, through the ribs, then with the fingers breaking down the lungs, perforating the diaphragm, and through it emptying the abdomen. I then passed up my hand, expecting easily to reach the feet, but my hand at once passed through a rent in the anterior wall of the uterus into the cavity of the abdomen. This rent was transverse, and appeared to be about, or a little above, the junction of the body and cervix. The tear seemed to be the consequence of the continued pressure of the uterus on the child, there having been no manipulation to account for it. The child's abdomen and thorax being now collapsed, the head came nearer the brim, the face being the part that came within reach. I fixed the blunt hook in the orbit, but the tissues of the face, bones included, broke down so readily that with the blunt hook and fingers I was able to give exit to the contents of the cranium. The head then collapsed, a foot was easily grasped, and the delivery completed. The child had evidently been dead some days. The patient felt relieved, was easy, but the pulse was rapid and thready. She never rallied, but died at 8 p. m. the same day.

There was no *post-mortem*.

CASE 5.—S. C. was delivered of her first child in 1846 by perforation. In 1848, she had a protracted labour. It was necessary to use the forceps, but the child was not born alive. The same occurred in 1849 and in 1851. Each time she made a good recovery, but none of the children were born alive. She became pregnant again in 1853, and I then advised her to have labour brought on at the seventh month. To this she consented. She had a good time, and made a rapid recovery, but the child did not live. In 1854, becoming pregnant for the sixth time, she determined to try what she could do with a midwife, and engaged one, an intelligent and experienced woman. At 8 o'clock in the evening, the midwife sent for me. She told me that the pains had been very strong for several hours, that the head had been impacted at the brim all that time, and that it had made no advance; that the pains had suddenly ceased, and that the head had receded.

I found the patient in a state of collapse, without any uterine pain, and suffering from intense pain in the epigastrium, and the head receded from the pelvis. I introduced my hand, and turned without difficulty, but was unable to complete the delivery, as the head became fixed at the brim. To get it away I was obliged to perforate behind the ear. The patient slowly rallied, and ultimately recovered, the treatment being principally the free administration of opium. It may be objected that this was not a case of rupture. As I did not feel any rent in the uterus, and as the patient recovered, a certain degree of doubt must attach to the proposition that rupture had actually taken place; still, I think, taking the symptoms into account, I am justified in drawing the conclusion that some rent had taken place in the muscular fibres of the uterus, the shock from which brought on arrest of uterine action, and collapse, and would have ended fatally if she had not been speedily delivered.

About eighteen months afterwards she had another confinement, was delivered instrumentally, and died half-an-hour after delivery.

From the first and third cases, we learn the liability to rupture, in women whose system is weakened by specific or cachectic diseases, and, consequently, the danger of allowing their labours to be too long protracted.

From the second and fourth cases, we observe the same liability in women who have borne many children, particularly if the mishap occurs of the child being in an unusual position; the primary cause of the accident being in one case the breech presentation, in the other the cross birth. With regard to the breech case, the uterus seemed so soft and degenerate that I do not believe the labour could have been safely effected, except by drawing down the feet before the waters had escaped. The opportunity of doing this had long passed before any mischief could have been anticipated. With regard to the cross birth, doubtless the woman's life might have been saved, if she had applied earlier for the assistance of a medical man.

In any case, in which rupture might be apprehended, it would be prudent to refrain from the use of ergot of rye; also, in such

cases as the fifth, when the uterus has to force the child through too narrow a pelvis. When it is considered advisable to turn, if the waters have escaped, the attempt should be made very gradually, particularly if the uterus is contracted on the child; and the patient should be fully under the influence of chloroform, so as to induce as much relaxation as possible. When, by this means, we have gently grasped one or two feet, if we find that the uterus is unequally pressed in any particular direction by the attempt to turn, it will be better to desist, and to complete the operation by the forceps or the perforator.

From the hints which I have jotted down in the review of these cases, I would suggest the following mode of practice; viz., when we are attending a patient, from whose antecedents and constitution, and from the slow and unsatisfactory progress of whose labour, we have reason to fear that we have a feeble, flabby uterus to deal with, our first care should be to soothe the patient, and keep her quiet until the os is fully relaxed; one or two small opiates will contribute to bringing this about. Then, when the os is fully dilated, rupture the membranes, and, if labour does not then proceed satisfactorily, deliver with the long forceps. In such cases as this I would particularly avoid the use of chloroform, except turning or the use of the forceps had to be resorted to.

NOTE ON THE USE OF ACID NITRATE OF MERCURY SOLUTION,

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FOR some years I have been in the habit of freely using the acid nitrate of mercury, in a greatly diluted form, as a local application to secondary and tertiary syphilitic ulcerations, and have met with a degree of success which I think justifies me in briefly outlining the plan of treatment I adopt.

The remedy is pre-eminently useful in secondary ulcerations of the throat, in which class of cases I have succeeded in obtaining a cure without the employment of any specific constitutional means whatever. I have also found it very valuable in tertiary ulcerations of the tongue; and, lastly, in syphilitic sores in any part of the body, more especially when the result of rupial eruptions.

In cases of throat affection, I commence the treatment by freely mopping out the parts with the solution properly diluted, and until lately I directed the constant use of a gargle in the proportions mentioned below; but, since the introduction into practice of "pulverised fluids," I have *chiefly* applied the remedy in that form, as being not only more effectual, but less irksome to the patient.

Care is necessary in graduating the strength of the solutions used. When intended for application to the throat or tongue, either as a gargle, wash, or in the form of spray, I invariably commence with one minim to the ounce, very gradually increased to two, or even three minims. Employed in these proportions, patients have rarely complained of any annoyance. In one or

two instances, however, it has been found desirable to reduce somewhat the strength of the solution, and even to discontinue its use for a day or two. When the throat is mopped out by the practitioner, a much stronger preparation may be used (3i.—3ii., ad 3i.), and if the ulceration is deep, or of phagadænic tendency, I have occasionally employed a more powerful application (3iv. ad 3i.), but this is rarely necessary. When applied to syphilitic sores on other parts of the body, I have found a lotion, composed of $\frac{1}{2}$ a drachm ad 3i., the most generally useful.

I now rarely or ever employ the acid nitrate of mercury as a caustic, either to primary sores or severe phagadænic ulcerations. When the full escharotic effect is required, I have found the strong nitric acid both more efficient and much less painful.

The following notes are abbreviated from my case book:—

J. B., admitted to Hospital January 14th, 1869. On examination, the mucous membrane of the throat was found highly congested, and of a purplish colour; great part of velum, including uvula, completely destroyed; large excavated ulcers over each tonsil. There was extreme difficulty of deglutition, together with severe and constant pain. In this case, the treatment was commenced by the application of the solution (3i. ad 3i.) to the excavated ulcers, and followed up by the continuous daily use of the remedy in the form of spray (m. i. ad 3i.) The result was marvellous, far exceeding my expectation. Relief was obtained from the first, and the patient left the Hospital on the 4th of February, with the throat perfectly healed. He could not be induced to remain longer, though I was most anxious to submit him to some constitutional treatment before permitting him to take his discharge. The sole medicine administered was opium, to allay pain at night.

R. B., a gentleman actively engaged in business, consulted me for long-existent and very troublesome ulceration of the tongue, together with nodes, and other tertiary symptoms. The local tongue affection was treated, for about a fortnight, by the constant and frequently-repeated application of the weaker solution. The result was the most marked improvement, strongly contrasting

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with the slow progress made in other respects, the general symptoms yielding with difficulty to the exhibition of large doses of iodide of potassium. The patient indeed suffered acutely from nodes and nocturnal pains, for more than six weeks after the ulcers on the tongue had completely healed.

I have notes of several cases, similar in their principal features to those above recorded. I trust, however, enough has been said to induce others to try the remedy.

Employed in the manner, and in the class of cases here described, I am satisfied the practitioner will find it invaluable for the relief of the severe local symptoms, thus permitting the necessary constitutional treatment to be carried out with greater ease and efficiency.

ON NODDING CONVULSIONS,

BY ALEXANDER DAVIDSON, M.B.,

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ECCLAMPsia NUTANS, or nodding convulsions,—or, as Sir James Clarke names it, salaam convulsions,—is one of the rarest forms of disease, only ten cases having been recorded in the medical writings of this and other countries, besides three or four others which are referred to as having been seen by Sir James Clarke, Sir C. Locock, etc., but have not been published. On account of this rarity, I think the following case of the disease deserves to be narrated, though I regret that I am unable from my observation of it to throw any further light on its pathology.

O. G. was first seen by me in February 1867, he being then nine months old. His parents were healthy, but most of their children had either died in infancy, or been still-born. This child suffered from convulsions during the first week of its life, and ever since had shown signs of mental weakness, never laughing or taking notice like other children. His expression of face was dull and heavy. His head was small and peculiarly shaped. The fontanelles were closed. In other respects he was of a tolerably healthy appearance, being full grown for his age, and well nourished. No teeth had as yet appeared.

Of late he had been suffering from peculiar convulsive paroxysms. These consisted of violent nodding of the head, and at the same time jerking of the legs upward, the whole body being for the moment thrown into a curve resembling emprosthotonos. This was repeated seven or eight times at intervals of less than half a minute, and was accompanied by convulsive twitchings of the arms. There was no loss of consciousness. The

attack appeared to give the child pain, and left him somewhat exhausted. These attacks recurred several times daily, coming on usually within two minutes after he wakened out of sleep.

Several remedies, including the bromide of potassium, were tried, without benefit. Ultimately the saccharine carbonate of iron was given in five-grain doses twice daily, and this treatment was followed by an immediate improvement in the child's state. The convulsions ceased to appear oftener than once in two or three days, and for the first time in his life the child began to smile and take notice. In April, being now one year old, he cut his first teeth; and, as dentition went on, the convulsive attacks recurred, the same in character, but more frequent and severe than before, causing him to scream violently during the fit. They were checked by lancing the gums. Soon after, he was taken to the sea-side, where he remained some weeks and improved greatly in health, and his nervous disorder took the form of slight convulsions — inward fits, with occasional slight attacks of spasm of the glottis. In June there was some return of the nodding, but only for a short time; and since that time it has never recurred. The treatment at this time consisted in the administration of cod-liver oil, and this was continued for a long time.

He was last seen by me in August 1868, after an interval of about a year. His general health during that period had been tolerably good, dentition had proceeded naturally, and he had been entirely free from the nodding convulsions. At this time he was beginning to suffer from epileptiform convulsions once a week or oftener. I have not seen him since.

This is undoubtedly an example of *ecclampsia nutans*, though it differs in some points from the other recorded cases. The characteristic symptom of the disease is the nodding of the head, repeated very rapidly, from 20 to 100 times, the attack coming on several times a day, usually after sleep. In this case the spasms were fewer in number, being only seven or eight during each attack, and followed one another at longer intervals; and, instead of affecting merely the upper part of the body, they extended to

the whole trunk, the pelvis and legs also being jerked forward. The most usual termination of the disease is in epilepsy.

This disease occurs in young children that are constitutionally weak from scrofula or hereditary syphilis. In the case of my patient, the family history indicates the probable existence of constitutional syphilis. As to the morbid anatomy nothing is known. Mr. Newnham, who has recorded four cases, thinks that there is strumous inflammation of the membranes of the medulla oblongata. It appears to me that the occurrence of the paroxysms immediately after wakening out of sleep shows that the exciting cause has some relation to the cerebral circulation. Probably disturbance, originating in the brain, is transmitted to the spinal chord, and gives rise to those tetanic-like convulsions.

The treatment which appears to have been most useful in these cases is the administration of iron and cod-liver oil, and the removal of any source of irritation in the gums or the intestinal canal.

REMARKS ON THE IMMEDIATE TREATMENT OF STRICTURE OF THE URETHRA,

BY REGINALD HARRISON, F. R. C. S.,

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UNDOUBTEDLY one of the greatest improvements that have been made in the treatment of stricture of the urethra is that associated with the name of Mr. Holt, and which is not inaptly denominated by him as "immediate."

Comment on the operation may seem almost superfluous, but, as some still hesitate to perform it, the experience of individuals who have given the plan a fair and impartial trial may, in some measure, tend to remove any prejudices which may stand in the way of its more universal adoption.

Of the various methods of treatment that have been practised, as far as my own experience and observation go, I have no hesitation in stating that the immediate plan places the patient suffering from organic stricture in the best position, both immediately and prospectively; that is to say, whilst the canal is dilated to a sufficient extent, the obstruction is so acted upon, that, with a minimum amount of care and attention on the part of the patient, he is secured from subsequent inconvenience. Not only is the canal stretched, but the material constituting the obstruction is deprived of, in a very great measure, or, more correctly speaking, prevented exercising, its contractile power upon the urethra.

To take an example; early in 1868 a gentleman placed himself under my care for stricture of some standing. He had been twice treated by gradual dilatation, and on each occasion, as far as immediate results were concerned, with success. He had learned to pass a bougie with a dexterity which might be envied; he never

neglected himself, and yet, in the course of a few months, sometimes weeks, he was obliged to seek relief from the surgeon. During the years 1863 and 1864 he was twice or thrice under my care, with similar results. I suggested other means, but without avail, until an absence from England for some period was impending, when he submitted to the immediate plan. He went abroad shortly afterwards, and has never had occasion to seek further surgical advice. I have twice, since his return, seen and examined him with a bougie, but, beyond feeling a slight roughness about the membranous portion of the urethra, have failed to detect any obstruction. I take this as affording a fair comparison between two methods, very much in favour of the immediate treatment. The instance I have taken is in no way exceptional. I have several patients, upon whom I have operated some years back, under observation, with equally satisfactory results.

In two cases recently operated on, perineal fistulæ were present. One occurred in my practice at the Northern Hospital, during the time I was honorary surgeon there. The patient, aged 45, had suffered from stricture for five years, the result of an injury to the perineum. This was followed by extravasation of urine, requiring free incision, and leaving a fistula, through which a considerable quantity of urine continued to escape. The patient's health was rapidly breaking down under the continual irritation. Very considerable difficulty at first was experienced in introducing the smallest size bougie; in the course of a fortnight I was enabled to get in the dilator and split the stricture. The fistula rapidly healed up, the patient's general health was re-established, and he left the hospital quite well, No. 12 bougie passing readily. Here we have a stricture resulting from rupture of the urethra, a form of obstruction least amenable to treatment, and which was rapidly undermining the constitution of the patient. The almost sudden restoration of the urethra to its natural calibre afforded a free vent for the urine, and permitted the closure of the fistula without any further local treatment.

Another case, complicated with fistula, occurred in my private practice, in the person of a delicate-looking young gentleman, who had suffered from stricture for nearly three years, coming on after

gonorrhœa. Twelve months before I saw him an abscess formed, which resulted in a fistulous communication behind the scrotum. Though from his appearance and general condition I was induced to hesitate somewhat before resorting to the immediate plan, I was surprised to find the rapidity with which he was completely restored.

When false passages exist, the advantages offered by the immediate plan are considerable. Some trouble is often experienced here in introducing the dilator, as would be the case with any other instrument, but, with a little patience, this is overcome. The withdrawal of the stilette, and the escape of urine through the canala, show that the instrument has reached the bladder, whilst the finger in the rectum indicates whether or not it has passed there in a legitimate manner.

The little hæmorrhage that attends the splitting is remarkable. This, however, is explained by the observation that has been made by "surgeons who have had the opportunity of examining the urethras of patients upon whom they had operated shortly before, and they found that the mucous membrane was entire, and that merely the indurated submucous tissue, or stricture proper, was torn. This may not of course be the case in every instance; but it is certain that in many Holt's dilator does not tear the mucous membrane, and hence the very slight symptoms produced" (Heath, *British Medical Journal*, No. 446).

The same condition of the parts observed after the operation explains why we have no reason for fearing extravasation or infiltration of urine into the tissues surrounding the urethra; such an accident has never occurred in my own practice, nor have I ever observed it in cases treated by other surgeons.

The pain caused by the operation is of so short duration, and frequently of so trifling a character, that it is hardly worth while placing the patient under the influence of chloroform; there is no objection to it as far as I am aware, and, in the case of highly nervous and sensitive individuals, its use is a decided advantage. Where we have false passages to contend with, it is, I think, better that the patient should not be anasthæsiated, as the introduction of the instrument in some of these cases is rather favoured

by the expressions of the patient. "There's a wrong road just about there," is not an uncommon remark with a patient, when the end of an instrument temporarily impinges upon the entrance of a false passage.

The immediate relief that is afforded is worthy of notice; I allude more especially to those sensations experienced by patients which commonly follow the introduction of bougies in cases of very tight strictures. This has been very aptly commented on in a recent number of the *Medical Times and Gazette*. "The nature of the relief afforded is not unlike that which follows the splitting or dividing of an irritable ulcer or fissure in the rectum. The division releases tension, and, so far from increasing irritation, gives relief" (Professor Fayrer of Calcutta, *Medical Times and Gazette*, No. 995). This explains why rigors immediately following the operation are comparatively rarely met with.

The extreme rapidity with which bad cases can be conducted to a favourable issue is also a characteristic feature of this method. The last case I treated at the Infirmary affords a good illustration, and I will briefly narrate it.

J. M'F., a labourer, aged 36, was admitted into No. 7 ward, on August 17th, 1869, with great difficulty in passing his water. It appears that he had suffered from stricture for six years, following an attack of gonorrhœa. On one or two occasions he has suffered from complete retention, and now only passes his urine in drops. On admission I succeeded in introducing the finest bougie through two strictures of no ordinary tenacity; by the 30th of the month I had with some difficulty advanced to a No. 4, and, on the following day, I put in the dilator, and split the strictures, drawing the urine off with a No. 12 catheter. A few drops of blood escaped, and but little pain was experienced. Rest in bed was enjoined, as a precautionary method, for twenty-four hours. On the second day a No. 12 bougie was passed readily into the bladder. The patient was now made an out-patient, coming to the Infirmary from time to time, in increasing intervals, to have the bougie introduced, until he could be entrusted with the charge of his own case. Here we have fairly instanced the more immediate advantages of the method employed, a fortnight serving to place the patient in a

position that he had not enjoyed for years, in spite of an obstruction of certainly not an ordinary character.

One precaution should not be omitted, namely, to examine the urine, before proceeding to operate; evidence may very possibly be afforded so as to render even the adoption of this so comparatively slight an operation undesirable.

Speaking generally, I have observed the greatest benefit follow the operation where the dilator, or a No. 5 bougie, passed into the urethra was held with tolerable tightness. Here, on smartly introducing the dilating rod, a sensation is at once experienced, almost like the snapping of an india-rubber band, indicating the complete rupture of the stricture. In these cases we may anticipate the most favourable results.

In the earlier forms of stricture that come under our notice, I prefer, as a rule, adopting the principle of gradual dilatation; in these cases the effusion, being soft and yielding, is readily acted on by the pressure of the bougie, and may be completely removed by absorption. Should, however, early treatment be neglected, and the constriction obtain contractile power, like an ordinary cicatrix, little can be hoped for by dilatation only.

In conclusion I would remark, that sufferers from organic stricture owe no slight debt of gratitude to Mr. Holt, for the very safe and successful plan of treatment he has placed in the hands of the profession.

POISONOUS DYES,

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SINCE the year 1856, the eyes of the world have been dazzled by a variety of new colours, of every hue and shade, and of unwonted brilliancy, produced chiefly from aniline and other products of distillation of coal tar. In every branch of decorative art these colours have become common, and they are especially used in dyeing articles of dress. During the past year some of the favourite dyes have attracted the attention of the medical profession, by producing irritation, and other symptoms of poisoning, when coloured articles of clothing are worn next the skin.

The brilliant magenta dye, rose-aniline, is produced by oxidation from aniline through the action of arsenic acid, which is reduced to arsenious acid in the process. Mr. Wanklyn first pointed out the fact that some of the arsenic remained with the dye as an impurity, and might produce poisonous effects if the dye were used incautiously for colouring clothing, toys, or confectionery. I am not aware, however, that any bad effects have hitherto arisen from this cause.

The colour which is at present notorious for producing local exanthema, and sometimes even more serious general disorder, is coralline. It is a bright red colour, resembling the old Turkey red, and is used for dyeing silken and woollen goods. Coralline is composed of two substances, a magenta basic dye, and a yellow alcoholic dye, called Naphthaline yellow.

Professor Tardieu of Paris (*Comptes Rendus*, July 5th, 1869), attributes the poisonous action to the dye itself, while M. Landrin

(*Comptes Rendus*, June 28th, 1869,) denies that the pure colour is a poison, and attributes the poisonous effects to metallic impurity.

I received from Mr. R. Harrison, F. R. C. S., a pair of red silk socks, which he had observed to produce an eruption on the feet of the wearer. One of these I submitted to a minute examination for arsenic, both by Reinsch's test, and by a modification of Marsh's method, and found that it did not contain the least trace of arsenic. I also dyed ribbons with magenta produced by the arsenic acid process, and with pure aurine (*rosolic acid*), which was kindly supplied by the manufacturers, Messrs. C. Lowe & Co., of Manchester, and with other coal tar dyes. These ribbons I tied round my arm, and wore continually for twelve days, with a negative result in all cases.

I conclude, therefore, that the poisonous property belongs to the coralline dye alone.

Coralline may be recognised by the following properties :

1. Like most of the new dyes, it is removed by boiling alcohol; the fabric, however, retaining a light salmon tint.
2. It is brightened rather than dimmed by ammonia.
3. The fabric dyed with it becomes yellowish-grey when treated with hydrochloric acid; the colour is restored by caustic potash or ammonia.
4. When a weak solution is examined by the spectroscope with transmitted white light, it absorbs all the rays from the middle of the green to the violet.
5. The colour is substantive to silk, but cannot be fixed on cotton without a mordant.

CARBOLIC ACID IN SURGERY,
By ROBERT HAMILTON, F. R. C. S.,
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If the testimony of all those who have given an extended trial to carbolic acid in the dressing of surgical lesions could now be collected, it would be a valuable help to an impartial observer in coming to a decision as to its merits. It has found many supporters, and in the majority of metropolitan and provincial hospitals it has its advocates.

In certain cases, when properly used, its efficacy is undeniable, and this has led to its having been tried in almost every form of solution of continuity of skin. It has failed to shew in many of them any advantage over other modes of treatment,—who could expect otherwise of any one surgical appliance?—and thus numerous illustrations have been given to its detractors, to strengthen their assertion that it professes no superiority in any case over older methods.

If another argument was needed to prove the desirability of a further report upon carbolic acid, after the many which have already appeared in the different periodicals, it might be found in the onslaught made upon it by Mr. Nunneley, in his address on Surgery, at the late meeting of the British Medical Association, at Leeds. This certainly has made it imperative upon all those who have had considerable experience in the use of it to come forward with facts and figures, and publish their conclusions.

If a goodly array of successful cases resulting from its use can be set forth, though it might not have much weight with Mr. Nunneley, yet it would, in the minds of most men, be the best answer to an attack based mainly upon theoretical grounds.

In the present paper, I propose to give the results of the adoption of carbolic acid, as a dressing in surgical lesions, at the

Southern Hospital, during the eighteen months, terminating in June last, namely, from the 1st of January, 1868, to the 30th of June, 1869, inclusive.

I also append a few particulars concerning the use of the same agent at the Royal Infirmary and the Northern Hospital, with which I have been favoured through the courtesy of the surgical staff of those institutions.

The cases in which the carbolic acid treatment was adopted at the Southern Hospital during the period named comprised—

Compound Fractures of all kinds,	-	-	61
Large Abscesses,	-	-	13
Lacerated Wounds,	-	-	28
Scalp Wounds,	-	-	12
Incised and Punctured Wounds	-	-	18
Resections (one of the Ankle-joint, the other of the Wrist),	-	-	2
Amputations (five of the larger Limbs, ten of Fingers and Toes,) -	-	-	15

The Compound Fractures consisted of

The Tibia and Fibula,	-	-	10
The Skull,	-	-	9
The Arm and Fore-arm,	-	-	7
The Wrist and Hand,	-	-	5
The Thumb and Fingers,	-	-	10
The Nose,	-	-	8
The Foot and Metatarsal Bones,	-	-	5
The Toes,	-	-	12

The Lacerated Wounds include those of

The Axilla and Chest,	-	-	2
The Knee,	-	-	2
The Cheek and Forehead,	-	-	9
The Arm, Wrist, and Hand,	-	-	6
The Nates,	-	-	1
The Thigh and Foot,	-	-	6

The Incised and Punctured Wounds include those

Of the Thigh and Leg,	-	-	-	-	4
Stabs of Abdomen, Chest, and Back,	-	-	-	-	4
Throat (Suicidal),	-	-	-	-	3
Elbow,	-	-	-	-	1
Knee Joint	-	-	-	-	1
Arm, Hand, and Wrist,	-	-	-	-	3
Forehead,	-	-	-	-	2

It would be tedious to the reader, even if space allowed it, to give in detail a precise account of each injury in the above list; it must suffice to say, that each one was of its kind severe, sufficiently so to render it necessary to take the patient into the hospital, and not treat him as an out-patient. The number of beds at the Southern Hospital is not at all in proportion to the demands made upon them, and therefore the admission of accidents into the wards has to be strictly limited to severe cases.

Now, taking the dates of admission and discharge of each patient as guides to the length of time occupied in effecting a cure, a reference to the In-Patient book shews that of the above, 20 were discharged cured, at or before the end of the first week, and these consisted of 14 lacerated wounds, including those of the wrist, cheek, and forehead,—2 abscesses (arm and leg),—and 4 incised wounds (abdomen and arm).

At or before the end of the second week, 33 were discharged cured, and consisted of 18 incised wounds (throat, elbow, knee-joint, leg and back); 10 compound fractures (skull, nose, thumb, fingers, and metatarsus); 1 abscess, and 4 lacerated wounds. Seventeen were discharged at the end of the third week, of which 4 were compound fractures (thumb, great toe, and fingers); 4 were punctured wounds; 2 were abscesses of large size; 7 were small amputations. Twenty-eight were discharged at the end of a month, and included 10 fractures (humerus, fingers, nose, great toe); 1 large abscess, and 15 severe lacerations (the axilla, the nates, thigh, knee); 2 amputations (the arm). Thirty-six were discharged between six weeks and two months after admission, and

these cases consisted mainly of large compound fractures (the tibia and fibula, the arm and fore-arm, the wrist and hand, the foot); three amputations of the leg, and 4 extensive lacerations (two of the arm and thigh, and two opening the knee-joint).

Fifteen cases remain to be noticed, four of these died. One a compound fracture of the skull, where the treatment had little to do with the result, as an autopsy revealed the fracture extending to the base, inflammation of the membranes, and pus coating the same. Death occurred ten days after admission.

Another was an old man with compound fracture of the hand, with a good deal of laceration of soft parts, caused by the hand being caught in a cog-wheel. Amputation three weeks after admission, death two weeks after amputation, from exhaustion. He only partially rallied from the shock of the accident; the injured limb never took on healthy action. Large abscess formed in the axilla.

The third death was that of a lad of 17, admitted with an abscess over the right deltoid muscle, extending upwards and backwards to the shoulder. The whole arm was greatly swollen, and there was much suppurative fever. He had received a severe blow from a heavy piece of timber upon the arm a few days before, and attributed the abscess to that. The latter was evacuated the day after his admission, with all the precautions recommended by Mr. Lister, under a curtain of carbolic oiled lint, with a lancet moist with carbolic oil, the surrounding skin oiled with the same, and an opening of large size being made to ensure rapid and complete evacuation. About twenty ounces of pus escaped. The next morning the dressings had to be renewed, so much offensive pus had streamed out from under the bandages, and from this time they had to be replaced with clean ones twice a-day. On the third day a rigor, and symptoms of pyæmia appeared, of which he died twelve days after admission, both knee-joints, wrists, and ankles being filled with pus. Whether it was a case of pyæmia when admitted, or whether the pyæmia was a result of hospitalism, cannot be determined. There had been no pyæmia for months in the wards. The suddenness with which it manifested itself also seems to render the latter supposition improbable. On the other

hand, it is quite probable that all our efforts were insufficient to prevent the entrance of septic germs into the wound ; and though he was surrounded with an atmosphere of carbolic acid, and had the wound washed each time with carbolic lotion, dressed with carbolic oil, with a further covering of carbolic putty, yet the pus which streamed out swamped them all in its offensiveness.

I regretted afterwards that a stronger solution of carbolic acid had not been used. That employed, being one of acid to ten of oil.

The fourth death was that of a young man suffering under phthisis, in whom a lumbar abscess appeared. This, when it had attained a large size, and had begun to point, was evacuated in the manner previously mentioned, and apparently with complete success. There was no further appearance of pus for ten days, and the incision seemed healed, when a slight discharge of thin pus set in, and continued for three weeks, before it finally ceased. The phthisical symptoms rapidly progressed, and he died four months afterwards.

The remaining eleven cases are made up of the following. Two boys admitted within a few days of each other with precisely similar injuries, a compound fracture of the left parietal bone, extending across the bone horizontally, three inches in length, the lower fragment depressed an eighth of an inch along the whole line of fracture ; the scalp wound was also extensive, a large flap being thrown back. In neither case was any attempt made to elevate the depressed portion, no symptoms of compression being present. The flaps were washed with carbolic lotion, dressed with carbolic oil, a dressing which was not removed till after the third day, when very little suppuration was found to have set in. The dressings were then daily renewed, and at the end of four weeks both wounds were healed, the amount of pus secreted throughout in both being surprisingly little.

The third case, an old man of 70, with compound fracture of tibia ; the recovery was tedious—constitutional causes seem to have retarded it. The wound was small, but the powers of life were feeble. He had three attacks of erysipelas in the limb. He was four months in the hospital.

Fourth case, another compound fracture of the tibia in a lad of 15,

who was ten weeks an in-patient. There was here a large wound of the calf of the same leg, not communicating with the fracture. Both wounds dressed with the carbolic oil, but it was the loss of tissue in the calf which rendered this case tedious.

Fifth case, a young man of 18, received a penetrating wound on the outer side of the right patella, the wound was two inches long, and the joint opened into. He did not apply at the hospital till three days after the accident, when intense inflammation of the joint had supervened. The leg was bent at an obtuse angle, the whole limb very much inflamed, and swollen, and the constitutional disturbance great. The pain on the slightest movement was intense. It was necessary to give him chloroform before proceeding to fix and dress the limb. Under chloroform, the leg was gradually straightened, the wound sponged with the carbolic lotion, and then the carbolic oil on lint, paste and tow applied. The whole limb, resting on an inclined plane, was swung from a cradle. The dressing was not changed for two days, the constitutional symptoms gradually subsided. On alternate days, the lint was changed. There was very little suppuration, and the wound slowly healed. There was some stiffness of the joint when he left the hospital at the end of six weeks, but the entire freedom of motion of the joint has now been recovered.

Sixth case, a boy of 14, was admitted, whose hand, having become entangled in machinery, was nearly torn off. On examination, a wound extended across the wrist, consisting of a semi-circular flap, which, on being raised, and the finger introduced under it, the latter entered at once into the joint; the carpal bones were nearly all loose, and displaced; all the palmar tendons were cut through; in fact, amputation had been almost effected, yet neither arteries were divided. Having determined to try and save the hand, I had the wound dressed in accordance with Lister's plan. Bandaging the limb to a straight splint, with the fingers and thumb bent over the one end of it. In the progress of the case there were no untoward symptoms; dressed on alternate days, suppuration was very slight; there was scarcely any swelling of the arm or fore-arm. He was allowed to get up on the third day, carrying the arm fixed to the splint in a sling. When the whole was healed, which was

a month after the accident, great thickening of the joint, with stiffness, remained. Subsequently, through a sinus, small portions of dead and loose bone had to be removed, but the boy has now quite recovered, with a good hand.

The seventh case, a lacerated wound of forehead on the left side, four inches long, extending from the edge of the hair half-way down the cheek. It might be more properly called a compound fracture of frontal and malar bones, both bones being broken, and a portion of the latter loose. He had been struck by a winch handle. The edges of the wound, after being cleaned, were brought together with sutures, and the carbolic acid dressing applied. The wound entirely healed by first intention, without the slightest suppuration.

The eighth case, compound fracture of the leg, in a woman of 60, with great displacement of the bone; two inches of the tibia had to be sawn off. The difficulty afterwards in keeping the limb in position was great, owing to the restlessness of the patient. From the same cause, erysipelas, and a succession of abscesses in the leg and thigh, followed, and though the bones have united, she is still an in-patient, four months after the accident.

The ninth case, frost bite of both feet in a negro, rendering amputation of the ten toes and two smaller metatarsal bones necessary, without sufficient skin being found to cover the stumps. Did well with the after dressing of carbolic acid. Three weeks under treatment.

Tenth and eleventh cases, two abscesses, one on the back, the other on the leg. The first, a young man of 20, admitted with a swelling under the right shoulder blade, which slowly increased; and an immense abscess formed, covering the whole scapula. When ready for lancing, it was opened on Lister's plan, and 32 ounces of thin pus let out; the sides of the sac were well pressed, and efforts made to completely empty the cavity. It was then dressed with the carbolic oil, and tightly bandaged. He was made to lie on his back—he had previously been unable to do so, from the size and pain of the abscess. The next day the dressings were not disturbed, as no pus had escaped below the bandage. It was not till the end of a week that the coverings were removed. No

pus was found upon them, the lint was dry, granulations filled up the incision, and the walls of the sac had collapsed and united. This was the most successful case of abscess evacuated on Lister's plan that has come under my notice.

The abscess in the leg, remaining to be mentioned, was not quite so rapid in its healing after evacuation. The man's leg had been crushed ten days before admission, and this had led to the formation of the abscess. When opened, about twenty ounces of pus were let out. On the third day the dressings had to be removed, so much matter had oozed down under the bandages, which smelt offensively. In the fresh dressings, a stronger solution of carbolic acid, 1 to 5, was made use of, and no further accumulation of pus in the sac took place; the lint was changed twice a day. It was a fortnight before the wound was quite healed.

In the cases above related, the method of applying the carbolic acid has not been described in detail; a few words upon the plan pursued are therefore necessary. Professor Lister maintains that carbolic acid dressings can only be successful, to the extent they have been in his hands, by a strict regard to the carrying out of the principle upon which he uses it, namely, that there are minute living organisms ever present in the atmosphere, which, when they come in contact with a wound, are the sole cause of the excess of suppuration, and of decomposition which so often ensues; and that these living organisms can be at once either neutralised, or destroyed, by carbolic acid. It is only necessary, therefore, to exclude atmospheric air from a wound to procure its rapid healing, and as this is impossible to do completely, then by using carbolic acid we can neutralise the germs, which through the medium of the air come in contact with the raw surface, and so attain the same end—a more speedy recovery.

With this thought guiding us, the above cases were treated, and though the minor ones may not have had such persistent efforts made in their after dressings to exclude the air, and organic germs,—in hospital practice this is almost impossible,—yet in all the more severe ones a rigid attention to the principle involved was adhered to. In the compound fractures, incised wounds, large

lacerations, and amputations, the washing of the wound or cut surfaces with clean tow, soaked in carbolic lotion of the strength of 1 of the acid to 40 of water, was the first step; the next was the carefully applying a triple fold of lint soaked in carbolic oil, the strength of which was 1 of acid to 10 of rape oil; over this, a large pledget of tow or cotton wool was laid, and then the whole bandaged. In many cases of compound fracture, and of stabs or cuts, when dressed within half-an-hour of the accident, and where the wound was not gaping, the washing with the carbolic lotion was omitted, and in many the edges were brought together with sutures, before applying the lint. In a few instances, Mr. Lister's antiseptic lac plaster was used, but as I failed to find any advantage in it over the carbolic putty, I generally preferred applying the latter over the lint, after the evacuation of abscesses, and in their subsequent dressings; also after amputations, resections, and the more severe wounds of joints. The carbolised putty being composed of carbolic oil, 1 to 5, mixed with sufficient chalk to make a soft putty; the latter being spread on tin foil before applying it.

The time which elapsed before the first dressing was removed was made to depend upon the general appearances in the neighbourhood of the injured part, as far as they could be made out without disturbing the coverings, and upon the general symptoms. If no increased pain or uneasiness, if no inflammation or swelling was visible in sound parts above or below the wound, and if no unhealthy discharge or smell was apparent, then the third day was allowed to elapse before the coverings were removed, and a repetition of similar dressings applied. With perhaps eight exceptions, where the first dressings were allowed to remain a week, the end of the third day was the usual time at which the second dressing was put on. The frequency of succeeding dressings depended entirely upon the amount of pus which bathed the wound; the greater the amount, the more frequent the fresh dressing. In about one-half, it took place on alternate days; in the majority of the remaining half, daily; whilst in a few, the dressings were changed night and morning.

I come now to the latest development of the antiseptic system,

the carbolised catgut ligature of arteries. In this a great advance in surgery has been made. The brilliant results obtained by Mr. Bickersteth, at the Royal Infirmary, in his two aneurisms*; so soon after Lister had published his experiments with the compound catgut ligature†, was a happy omen of the success likely to follow this new method of securing arteries. Any one who has read Mr. Lister's paper must be strongly impressed with the force and weight of his arguments, and, if so, will not be unwilling to try his plan when occasion offers. We have at the present time three rival methods of arresting hæmorrhage, Sir J. Y. Simpson's acupressure, Mr. Lister's catgut ligature, and torsion, each of them devoid of many of the drawbacks which beset the old plan. Acupressure has now been before the profession for some time, and I think I am not wrong in saying that, though from the eminence of its originator it has been extensively tried, yet only a very few surgeons have permanently adopted it, in lieu of the old ligature; my own trials of it did not encourage me to persevere with it. The introduction of a number of needles in the flaps of an amputation, even though they remain but a few hours, has several objections; among them is the mischief done to the soft parts by the amount of pressure put upon them by so many needles at a time, when their vitality is at a very low ebb. A feeling of uncertainty attends the mere use of torsion, which will probably prevent its general adoption, except for small arteries. Professor Lister's plan being free from these objections makes me anticipate that the advantages aimed at in acupressure will be obtained with more certainty and security in the catgut ligature. One result is sure to follow, if even catgut and carbolic acid fail, operators will no longer hesitate to cut off short both ends of the ligature, and thus, reversing the proverb, risk the ills they know not, rather than bear those they have too well known.

The cases in which I have had an opportunity of applying the compound catgut ligatures were two amputations of the leg, in which I tied the anterior and posterior tibial arteries, cutting off both ends of the ligatures short, with very satisfactory results, so

* Published in the *Lancet*, May 29th, and June 12th, 1869.

† Vide *Lancet*, April 8rd, 1869.

far as fixity of tenure was concerned. Beyond that I cannot speak, as in both cases, from the previous unhealthy condition of the patients, and other causes, much of both flaps sloughed, and though we had no further trouble with the arteries, yet portions of both tibiæ and fibulæ had to be removed subsequently; and whether the ligatures remained, and became organised, or separated and passed away in the discharges, could not be made out. The catgut was the thickness of ordinary crochet cotton, and was saturated for some hours previous to using it in carbolic lotion, 1 part to 10. That there are difficulties connected with the use of the catgut must be admitted. In employing it for sutures, I have more than once found the following to occur; the catgut itself has broken, under the continued strain of holding two parts together; not that the knot has untied, though this happened once to me, but the part of catgut hidden from view has yielded, some hours after being applied. However, these two difficulties are probably capable of being overcome, by using catgut of sufficient thickness, and by immersing it in a carbolised fluid, to increase its tenacity, such as a solution of glue or gum, to which has been added some carbolic acid.

The CONCLUSIONS at which I have arrived from observation of the 150 cases related, are these,—that in a few compound fractures and stabs I have seen results follow the plan of hermetically sealing the wound with lint, soaked in collodion or in the fresh blood, equal to the best observed under the carbolic acid treatment; and as the good effect of sealing up the wound with either of the former is due to the successful exclusion of the air, it strengthens the position of the advocates of carbolic acid, who use the latter with the same end in view; but as collodion and fresh blood are of such limited application, being only available where the external opening is comparatively small, the wound clean, and the time which has elapsed from receipt of injury short, the carbolic acid is of general application, and therefore more useful. It was in the compound fractures, in wounds opening the knee joint, in compound dislocations, and in stabs of great depth, that the striking effects of the carbolic acid dressings were best observed. Their

superiority to water dressings and poultices in other cases, such as large lacerations, consisted in their greater cleanliness, absence of smell, diminution of discharge, and increased comfort to the patient, and not in the rapidity of healing. It is not the depth, but the superficial extent, of skin to be made good which determines the length of time required to heal a lesion; and as the difficulty of applying the antiseptic system increases in proportion to the extent of surface to be made good, and becomes almost impossible where the loss of skin is great, so the fact of the length of time in healing varying so little, in such cases, under the old and new systems, does not invalidate the antiseptic principle because it is really due to the imperfection of our plans for bringing it to act in all its integrity in these instances.

A few words now upon the antiseptic system as explained by Mr. Lister. He bases his theory upon the existence of organic germs in the air, but I do not see why there may not be infinite variety in the nature of the particles floating in the atmosphere, many of them not being organic, that is, not derived from either the animal or vegetable kingdoms, which yet exercise an injurious effect on a suppurating surface, quite as readily as the living organisms of Lister. I don't deny the existence of the living organisms, because I believe they are often present, and that some forms of them are the active agents in producing pyæmia, traumatic tetanus, and erysipelas; but in the ordinary run of cases, where a wound or discharging surface seems long in healing, if the cause is not purely a constitutional one, then it may be that the atmosphere is contaminated with some element from the inorganic kingdom, which is interfering with nature's processes in the sore. Both 'influences,' for one can only speak of these unknown particles from the organic and inorganic kingdoms in most indefinite language, must vary in their effects. There may be organic germs too minute for microscopic eye to discern, which, fastening on a wound, retard but do not suspend its healthy progress; there may be others of more potent influence, which produce greater mischief, and check the curative process for a time; and there may be still more baneful ones, whose contact and absorption is the setting up of disease, resulting even in death. And again, there may be

inorganic particles belonging to the mineral kingdom, which, lighting upon a wound, stop its healthy progress, or even develop mischief in various forms.

It is this variety in the atmospheric forces at work which makes me hesitate to accept carbolic acid as an antidote for them all. It may be the best as yet known, and may be potent with many a germ and particle, in neutralising their power for evil; but it is taking too limited a view of the other forces evolved in nature, and probably to be obtained therefrom, to assume that the immensity of invisible life, which is unceasingly bursting into activity around us, is not opposed by as great a variety of agents from the mineral and gaseous kingdoms, as there are forms of life to be destroyed. Many a drug we now use may owe its effectiveness to an antiseptic property not hitherto understood. And such is probably the explanation of the action of iodine, sulphur, creosote, and a host of others.

All this may be said to be supposition and guesswork, clothed in language too undefined to be of much value; but such is scarcely the fact. In a region where a certain amount of solid ground has been found to work upon, one advances cautiously, unable to stand still and abstain from speculating altogether upon the unknown land, seemingly so near, and yet may be so far off. I say seemingly so near, because the facts daily observed in hospital routine accumulate as the years go on, and the new light from other sources thrown upon them establishes them the more firmly in our minds, and we feel we are getting nearer and nearer the truth. Who can have watched for years, in public and private practice, a succession of wounds and lesions of varying degrees, without having become convinced that surrounding atmospheric influences greatly determine their course. Let but this point be conceded, and I think it is by all those of large experience, and what an advance it is. The insight from that stand-point we are striving to obtain, is into the kingdom of the atmosphere, if I may so express it; and though Professor Bennett says, "atmospheric dust from crowded assemblies, from the summit of the highest building, from empty cathedrals, and from ancient vaults has been ransacked in vain to discover organic germs," yet it has not been wholly in

vain, the evidence is not all negative; and there are facts, established through the researches of M. Pasteur, which all the labours of M.M. Pouchet, Musset and Jolly fail to controvert; and we wait with longing impatience for the reports of the hosts of savants who are now carrying on independent investigations into the varying contents of the atmosphere, before we dismiss the germ theory, which fits in with so many observed facts, and helps to explain so much of what was before unintelligible and obscure.

At the Royal Infirmary, the carbolic acid has been employed by Mr. Bickersteth since its first introduction. All his cases are treated by it, he continues a warm advocate of it, and I need only refer to his two papers in the *Lancet*, on the antiseptic treatment of wounds, to prove how thoroughly he adopts the antiseptic system of Professor Lister. The precautions he took in the two cases of aneurism there described,—in which he tied the common carotid and external iliac arteries with catgut ligatures, to prevent the entrance of septic germs, and to promote the rapid healing of the wound under the use of the carbolic acid,—shew his continued faith in the system. These two cases were the first in which the carbolised catgut ligature was successfully applied to the human subject.

After amputations, in the dressing of stumps of compound fractures, and of all wounds, the carbolic acid lotion and the carbolic oil are used. The composition of the C. A. lotion is carb. acid and methylated spirit, of each 3ii, water oi. being 1 in 40. The C. oil is 1 part of acid to 12 of linseed oil. Mr. Bickersteth also frequently uses the antiseptic lac in his more severe cases. His plan is to cut a piece of lac plaster of the required size, dip it in water, which causes the lac to separate from the calico on which it is spread, and the lac, if found perfectly impervious, is then put over the C. O. lint covering the wound, and made to adapt accurately to the part.

At the Northern Hospital, the carbolic acid has not been very extensively tried, but so far as it has been used the surgeons speak favourably of it. Two cases of amputation of the arm, under Mr.

Lowndes' care, were dressed from the first with carbolic oil, and at the time I saw them, between three and four weeks after, had almost completely united. The mode of dressing adopted by Mr. Lowndes was, after the operation, to put a piece of dry lint over the flaps, and over this three layers of lint soaked in carbolic oil, of the strength of 1 to 40 ; above these, gutta-percha tissue ; and lastly, bandaging. These dressings, with the exception of the dry lint next the flaps, were renewed every other day. The dry lint was not removed for a week.

Two cases of compound fracture of the leg, under Mr. Manifold, had, upon admission, the wounds dressed in accordance with Mr. Lister's plan, and no suppuration occurred, the wounds healing rapidly. These are the only instances in which the carbolic acid had, at the time of my inquiries, been employed at the Northern Hospital.

ON SOME PECULIAR RESULTS OF INJURY TO DIGITAL NERVES,

By W. M. BANKS.

THE amount of suffering which results from injury to the trunks of nerves is sometimes apparently out of all proportion to the severity of the original lesion. Throughout the Medical Journals, for the last twenty or thirty years, are scattered numerous isolated cases of general tetanus, convulsions, local spasms, violent neuralgias and anomalous affections of every description arising from injuries of such a trivial nature as a slight cut or a mere prick. The following cases are examples of great pain and suffering consequent upon very trifling injuries to digital nerves, which were relieved in each case by the excision of a portion of the affected nerve. I assisted Mr. Bickersteth (in whose practice they occurred, and who has kindly allowed me to publish them) at the operations, and took the following notes of the cases during their progress.

On October 30th, 1867, a young married lady consulted Mr. Bickersteth, complaining of great pain in the fore finger of the left hand. About a fortnight previously she had given herself a pretty severe cut with a bread knife. The wound had healed well, and its cicatrix was still quite soft. It was a little in front of the metacarpo-phalangeal flexure of the finger, and was partly on the palmar and partly on the outer aspect of the digit. It was a slanting cut, and its deepest part was just over the outer digital artery and nerve of the fore finger. Although the wound had healed well, the patient had suffered intense pain in the finger, so severe as even to deprive her of sleep; indeed she had not had any rest at night for a fortnight. The finger was somewhat swollen and stiff, and had a peculiar glazed look about it, which

pointed to some injury of the nerve. It was therefore resolved to lay bare the digital nerve at the site of injury, and remove a portion of it. The soft cicatrix was broken up with a probe, and a small linear incision was made nearly at right angles to it, over the position of the nerves. With some little dissection the nerve was reached, and a portion of it—along with some little adherent pieces of fatty tissue—removed. The accompanying artery was cut, but soon ceased bleeding on the application of cold. The little flaps were then nicely adjusted with sticking plaster, and dry lint put on. On examining the pieces which had been removed, two of them were found to contain portions of the nerve, one about $\frac{1}{4}$ of an inch long, the other much smaller. Nothing could be detected wrong with them after a most careful examination, both by the naked eye and with the microscope.

The patient returned on November 2nd, three days after the operation. The wound was healing rapidly, the edges having united at once. *She had suffered no pain whatever*, and had slept well at night. Sensation was lost along the greater part of the outer side of the finger.

On November 8th, the wound was quite healed; the patient had suffered no pain since the operation, and the swelling and glazed appearance of the finger had greatly, but not quite completely disappeared. Sensation along the outer side of the finger was decidedly improving, so that the non-sensitive portion was now confined to a narrow strip on the outer edge of the finger, reaching from the second joint nearly to the tip.

On September 19, 1868, Mrs. ——— consulted Mr. Bickersteth. She was a healthy woman, 60 years old, but very active and vigorous for her age. In the previous May she suffered from a whitlow, situated at the base of the ring finger and adjacent portion of the palm of the right hand. To relieve this, an incision was made by her medical attendant on the inner side of the base of the ring finger, just below the cleft between it and the middle finger. She recovered perfectly from the whitlow; *i. e.*, there was no stiffness or contraction of the tendons as a result of the whitlow; but yet the hand did not regain its former strength, and soon the ring finger became the seat of excessive pain, which in time affected the others

also. The pain next extended up the arm, occasionally even as far as the shoulder. On examining the hand, the fingers were seen to be somewhat stiffened and attenuated, and presented, especially the fore finger, the peculiar glossy appearance of the skin mentioned in the previous case. The affected arm was distinctly smaller than the other, and had a wasted appearance. The constant worry of the pain, and the annoyance arising from the inability to use the hand, had considerably impaired the patient's health. On looking carefully at the site of the whitlow, the cicatrix of the incision above mentioned was seen to be seated exactly over the digital nerve supplying the inner side of the ring finger, a little beyond the point where it separates from the nerve supplying the adjacent side of the middle finger. It was considered that the nerve had been injured at this point, and that a portion of it should be excised, the patient being willing to undergo any operation in consequence of the increasing severity of the pain.

On September 22d, chloroform was administered, and, a tourniquet having been fastened over the brachial artery, in order to prevent any bleeding from interfering with the ease of the dissection, a good long incision in the line of the cicatrix and subjacent nerve was made, and, the nerve having been readily found, about $\frac{1}{2}$ -inch was cut out. Several Pacinian bodies were dissected off the sheath of the flexor tendons, which, as well as the digital artery, was left carefully intact. The wound was brought together with three stitches, sealed up with a little scraped lint and styptic colloid, and a small splint put along the back of the hand and two first fingers.

On September 24th, two days after the operation, the patient called. The wound was still covered with a crust of lint and colloid, and there was no inflammation of the adjoining parts. She says that now she *has no pain in the fingers and hand, and none in the arm as far as the elbow*, although the shoulder and upper arm are still painful, but not exceedingly so. The inner side of the fore finger feels "queer" and numb, but sensation is not completely lost, while the tip is everywhere quite sensitive.

On September 29th, strapping and water dressing were applied to the wound, which was not completely united, but looking very well. There has been no return of pain in the hand or fore arm,

and in the shoulder and upper arm the pain is now only occasional. She was directed to rub with a soothing liniment, and ordered a tonic, containing quinine and phosphate of iron.

On October 15th, the patient was seen for the last time. The wound had been healed completely for about ten days. The backs of the fingers do not present the same glazed, tight, thin-skinned appearance which they formerly had, but the skin looks thicker and more natural, and has little wrinkles in it. The acute pain is quite gone, and the patient sleeps well, her only complaint being of a curious feeling along the under and inner part of the fore finger which the excised nerve had supplied, and of a little occasional aching in the shoulder. Her general health has greatly improved, and she can pick up things with the affected hand, and is rapidly regaining the use of it.

In his treatise on the diseases of the fingers and toes, Mr. Annandale narrates a case, which in its leading features is very similar to those just detailed. The patient inflicted with a sharp knife a wound over the palmar and lateral aspect of the first phalanx of the ring finger of the left hand. The wound healed at once, but soon she began to suffer extreme pain in and around the cicatrix. Burning sensations passed up into the hand, fore arm and elbow, and even into the arm. The elbow, wrist, and digital joints became stiff, the nails were dry and brittle, and the fingers had the characteristic glossy appearance. The slightest touch on the injured finger caused such distressing pain that the patient could scarcely permit the hand to be approached, much less manipulated. Curiously enough, she also began to suffer from burning sensations in her right hand, and sometimes in the soles of the feet. She was under the care of two medical men, who employed every kind of local palliative application and general tonic treatment in vain; and at last she willingly consented to have the finger upon which the cicatrix existed removed by Mr. Syme. In the course of ten days she was quite free from her former pains, and allowed Mr. Annandale to grasp the affected hand freely, move the fingers and wrist joint, and in fact handle the limb in a way she could not for amoment have borne previously. On dissecting the amputated finger, he

found that the digital nerve which lay beneath the cicatrix had been partially divided, and had become re-united. There was an enlargement upon it at this point. He also noticed that the Pacinian bodies in connection with the nerves and their branches on the palmar aspect of the fingers were particularly well developed.

These three cases present features of great similarity. In all, a cut with a sharp instrument was inflicted on a digital nerve. The wounds then healed well, but shortly afterwards severe pain arose in the cicatrix, which soon involved the affected finger, then the hand, and finally the whole arm and shoulder; and, in Mr. Annandale's case, the other arm and the soles of the feet seemed to suffer in a kind of sympathetic manner.

Although Mr. Annandale in his case discovered an enlargement in the affected nerve at the point of injury, and also a certain amount of vascularity beyond what was normal, I certainly must admit I could not find any indication whatever of the original injury in the excised portions of nerve which I examined. That this does not militate against the fact that the injury to the nerve was the *origo mali*, is shown by cases in which a mere prick has sufficed to produce symptoms similar to those described above. Wardrop detailed a case (quoted in Holmes' *System of Surgery*) where a woman pricked the fore finger of her right hand with a thorn. She suffered pain and swelling in the wounded finger, and part of the middle one. The swelling disappeared after some time, but the pain continued for months in the finger, the end of which was extremely sensitive. She had daily attacks of pain, which shot up the arm and side of the neck, producing a sensation in the hairs of the head as if they had become erect. To these feelings succeeded a dimness of sight; and the pain afterwards went suddenly into the stomach, followed by sickness and vomiting. She had constantly the feeling of a lump in her stomach, and always vomited after taking food or drink. The finger was amputated at the second joint, and in half an hour afterwards all her symptoms disappeared, her general health was soon completely re-established, and she never had the smallest return of her former pain.

M. Berard's case was a similar one. For the purpose of a galvanic experiment he had a needle forced into the branch of

nerve which issues from the supra orbital foramen, and an electric current was directed throughout the division of the nerve. At the instant, violent pains were felt over the forehead and crown of the head. The pains ceased when the needle was withdrawn, but some months afterwards a fresh attack of neuralgia was experienced in the division of the wounded nerve. The pain had the quotidian intermittent type, and gave way to the use of sulphate of quinine. After that period, repeated attacks of neuralgia occurred, with many years interval, some of which were excessively violent and long continued, and always seated in the frontal branches, but sometimes extending to the nasal and lachrymal branches of the ophthalmic nerve. Again, in former times, when bleeding from the arm was practised by any one, however unskilled, instances every now and then occurred where pricking or division of some of the cutaneous nerve filaments which run in close proximity to the median-cephalic and median-basilic veins, was followed by very severe pains in the arm. It is obvious, then, that if we find such severe effects from the mere puncture of a nerve, that the train of symptoms arising in the two cases first narrated, and in Mr. Annandale's case, can be quite reasonably ascribed to the injuries to the nerves severally received; that is to say, that the nerve injury was all along the direct cause of the pain, and that the patients were not mere hysterical women, suffering from a particular manifestation of the general malady which they ascribed to the occurrence of a slight cut on the finger. That continued irritation of even the minutest twig of a nerve may suffice to produce the greatest agony, is well illustrated by the following case, which, although not one of injury like the others, is yet, I think, sufficiently interesting to excuse its insertion.

The patient, a young woman, about 18 years of age, noticed, fifteen months before her application to Mr. Bickersteth, a little black spot on the back of the right forefinger, between the root of the nail and the first joint. She described it as having the appearance of the mark produced by a small splinter running into the finger. It increased in size, and eventually had the appearance of a corn. As it caused considerable pain, she con-

sulted a surgeon, who first applied nitrate of silver, but without effect, and afterwards cut the piece out. Some "proud flesh" appeared, and a white powder on lint was applied to the wound, which produced a slough. This treatment was most effectual, and the patient suffered no pain for many months, when the disease reappeared, exactly as before, as a black spot with a clear shining margin, only this time it appeared midway between the first and second joints, on the back of the second phalanx of the finger. This second growth was cut out also, and the wound was healed in a fortnight. But it was very painful while healing, and as soon as it was healed, the cicatrix began to assume the same thickened corn-like appearance as the original growth. She now suffered intense pain all up the arm, even to the scapula, which existed night and day, completely wearing her out, and at night amounted to positive agony, which quite precluded proper sleep.

The affected finger was somewhat swollen about half way down, between the second and third joints, and the cicatrix was a smooth, slightly elevated, glassy-looking hardness, resembling a corn which had been pared down; the rest of the finger was not excessively sensitive, but the slightest touch on this point caused great agony. The callosity was carefully cut out, and when removed there were visible, in the bottom and at the edges of the wound, a number of Pacinian bodies. They were quite distinct, and there was no mistaking them; harder, whiter, and more oval than the surrounding fat granules. Six or eight of these were dissected away, and with some of them a filament of nerve was found, and *a very distinct nerve filament was also found running right into the callous cicatrix and incorporated with it.*

Next day patient returned, and stated that she was much relieved, *had but little pain in the day time, and had slept well nearly all night.* On March 12th, four days afterwards, patient said that she now had no pain whatever in the arm, although on the previous night there had been very uneasy pricking sensations in the finger and back of the hand. The patient came to present herself at intervals for about a month or more. The wound healed, leaving a smooth cicatrix, without any excessive contraction, and

not very hard. The pains lasted for some time about the finger and hand, and then gradually became less and less, till at her last visit they had all but disappeared. She slept well at nights, and was rapidly recovering her strength, which had been so much worn out by the previous protracted and severe suffering.

To return, however, to the original cases of injury to digital nerves, there are one or two points of interest which may be noticed. In the first place, as was seen, Mr. Annandale in his case detected a certain amount of thickening and congestion of the nerve at the site of injury, and he also believed that the Pacinian bodies were increased in number and size. According to Bèclard, and other French authors who have paid some attention to the subject, after puncture of a nerve there remains either in the whole thickness of the nervous cord, or, if the puncture has been very limited, at one point of its circumference only, a hard opaque swelling of a fibrous consistence, which is invariably formed by a thickening of the fibro-cellular tissue. In the portions of excised nerve which I examined, I must frankly admit I could not find any change; but in the last narrated case, where a hard corn-like substance was removed, there was no doubt that the Pacinian bodies were, if not increased in number, (which I am strongly inclined to think they were,) certainly increased in size, as they could be picked out from among the fatty tissue with the greatest ease. In a case of injury to a digital nerve, followed by great pain in the arm and atrophy of the affected finger, which was admitted into the Royal Infirmary here some time ago, the finger was removed at the patient's urgent desire. A complete cure resulted, but I regret that I am unable to give the details of the case. However, I dissected the amputated finger very carefully, and certainly the Pacinian bodies were capable of being displayed with an ease which is not the case in a perfectly healthy finger. Until, however, I could see a few more such cases, I should not be inclined to make any distinct assertions as to the increase in size and number of the Pacinian bodies following nerve injury, as it is a difficult point to determine. My impression, however, is that such increase does occur.

In the second place, it is plain that the plan of excising a

portion of affected nerve is an immense improvement upon amputation, in all those cases where the nutrition of the finger has not been so much interfered with that general atrophy has resulted. If a tourniquet be applied so as completely to keep the wound free from blood, it is not by any means difficult to perform, and the advantages are so obvious as to require no comment.

Lastly, there are some curious points connected with the manner in which sensation was affected by the excision. In the first case, a portion of the nerve supplying the outer side of the fore-finger was removed to the extent of fully more than a quarter of an inch, and yet on the third day sensation was lost, not along the *whole*, but *only along the greater part*, of the outer side of the finger. On the ninth day the non-sensitive portion was confined to a narrow strip on the outer edge of the finger, reaching from the second joint nearly to the tip. Again, in the second case, where the digital nerve supplying the inner side of the ring finger was removed to the extent of nearly half an inch, on the second day after operation, the part supplied by the nerve felt numb, but was *not quite destitute of sensation*, while the whole tip was quite sensitive. These points seem worthy of notice, as showing that the branches of the digital nerves extend so completely round the fingers, that if one nerve be divided, the branches from the opposite one are sufficiently numerous, and their connections with the terminal branches of the divided nerve sufficiently free to maintain partial sensibility even over the part of the finger supplied by the divided nerve. That such a view is probably correct, is shewn by the very interesting observations which have been recently made by two French surgeons, MM. Arloing and Tripier, which tend to prove that the peripheral ends of the three nervous trunks (radial, ulnar and median) which supply the hand, remain sensitive, even if only one of these nervous trunks be left intact.

NOTES ON THE OPERATIVE TREATMENT OF INFLAMMATIONS OF THE EYES,

By T. SHADFORD WALKER,

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Few departments of medicine or surgery have witnessed greater changes, especially of late years, than that which devotes itself to the study and treatment of Diseases of the Eye. One of the most important, if not the most important of these changes is, the substitution of operative for continued antiphlogistic or expectant treatment, in disorders of an unmistakeably inflammatory nature, or where increased tension of the eyeball, accompanied with severe pain and rapid loss of vision of one or both eyes, occurs. The main object of the following brief notes and cases, is to point out where operations have been of use in instances coming under the writer's notice, and the symptoms or conditions which have rendered recourse to surgical interference necessary or expedient, as well as to indicate the danger of leaving changes of a character destructive to useful sight to go on unchecked, in the belief that modes of treatment in accordance with the views entertained before the most recent researches had brought better methods within reach, would prove serviceable or satisfactory.

Consistently with the limits of the paper, it will be convenient to restrict the diseases requiring operative interference to the following; since they are specially important, are met with most frequently in general practice, and exhibit in the plainest manner the good effects of the procedure recommended, viz.—keratitis with perforating ulcer and hypopion, strumous keratitis, with great vascularity of the cornea and deposit of lymph, scleritis, iritis, and glaucoma.

Before commencing a narration of cases, it will be well to

describe succinctly the two operations to which recourse is most frequently had for the relief of the above named diseases, viz. iridectomy and division of the ciliary muscle, since, although familiar to and recognised by oculists, they are not sufficiently so, to those who have not made ophthalmic surgery a special study to render some account of the mode of performance unnecessary. The third, paracentesis, or tapping the anterior chamber, explains itself.

Iridectomy then consists in the removal by excision of a portion of iris, generally of considerable extent, about one fifth, from any part of its circumference, at the discretion of the operator, though ordinarily that portion of iris covered by the upper lid is selected. The eyeball is first fixed by forceps, and the lids kept apart by a speculum. A lance-shaped knife, or Graefe's cataract knife, may be used for making the incision through the cornea, which should commence about half a line in front of the junction of the cornea and sclera, the knife being carried forward paralld to the iris, across the anterior chamber, should either cut its way out, as in the incision for cataract, if Graefe's knife is used, or be withdrawn through the original opening, if the lance-shaped knife is used. The iris is next seized with a pair of fine forceps, drawn gently outwards through the corneal wound, and the border nearest the operator is then cleanly cut with a pair of probe pointed scissors, after which, the remaining portion is snipped off, care being taken to have the cut edges evenly divided, and that no portion of iris remains in the wound. Any hæmorrhage from the cut surfaces into the anterior chamber should be removed with the spoon end of a curette. It is important that when iridectomy is performed for glaucoma or iritis, the iris should be removed quite up to its ciliary attachment, in order that the relief to the tension and inflammation may be as complete as possible. For other purposes, various modifications in the performance of the operation, and somewhat different instruments, are often required to suit special exigencies; the method just described is, however, the one most frequently practised in the treatment of the cases to which the paper refers.

Division of the ciliary muscle is useful in cases where there is

a considerable amount of inflammatory action going on in the iris, sclera or cornea, of a subacute character, and attended with moderately increased tension of the globe and general vascularity. Its good effects are most marked, when, in spite of constitutional and local treatment, the pain and congestion remain unrelieved, and deposit of lymph continues unchecked, whether these symptoms are caused by injuries to the eyeball, or arise spontaneously. It is a convenient substitute occasionally for iridectomy, where the latter may be required, but from any cause cannot be immediately performed; sometimes, indeed, in the slighter cases of increased tension, its adoption has rendered the performance of iridectomy unnecessary, though, undoubtedly, it cannot take the place of iridectomy, in serious or acute glaucomatous affections. Nor in milder cases should it be often repeated, unless marked improvement of vision and of the coexisting train of symptoms occur.

The operation is simple, and easily performed, as follows:—The patient being seated, the operator standing behind, with the patient's head resting against his chest, separates the eyelids with the first and second fingers of his left hand, at the same time fixing the eyeball with them; then with his right, he passes a broad cutting needle or Sichel's knife into the globe, and at right angles to its surface, just behind the junction of the cornea and sclerotic coats, to the depth of about one-sixth of an inch. So soon as the needle or knife has penetrated, he turns it across the incision, when there is a free escape of serous fluid and some blood. If the tension and engorgement are considerable, the fluid will often spirt out to some distance. If the operation is properly done, the anterior chamber should not be opened, nor ought the iris to be wounded, or protrude through the small opening in the sclerotic.

CASE 1.—Acute Keratitis, with Sloughing Ulcer of the Cornea and great Sclerotic redness. A man, aged 50, while at work, received a blow from a piece of stone near the centre of the cornea. At the moment he felt great pain, which continued until the extraction of the stone four days afterwards. It was found to be imbedded in a hollow filled with pus, which had partially

separated the layers of the cornea, and found its way into the anterior aqueous chamber, to nearly the height of the lower edge of the pupil. The conjuction and the sclerotic were greatly injected; the pain in the eye and brow, especially at night, was so severe, that the patient could not sleep; by course, vision was very much impaired. The treatment consisted in the removal of the foreign body, in the evacuation of the pus accumulated in the anterior chamber by paracentesis with a broad needle, and in the division of the ciliary muscle. This last procedure became necessary, because, although the condition of the cornea was improved after the tapping of the aqueous chamber, the eyeball remained painfully tense and injected. These symptoms began to subside on the day after the operation, which it was not found needful to repeat; and the patient made a good recovery, the only obstacle to perfect sight, being a small nebula at the seat of injury; which, however, did not prevent his seeing sufficiently to do labourer's work. The only medicinal treatment employed, was the application of belladonna collyrium to the wounded eye, and internally, quinine in the day time, with two grains of opium in a pill at night, to ease the pain.

CASE 2.—Acute Keratitis, with a large Excavated Ulcer at the inner margin of the Cornea, the result cold, over nursing, and neglect. The history of this case shews the importance of early treatment, where deep ulceration occurs in the course of keratitis, particularly where there is a drain on the vital powers. The patient, a married woman, aged 30, took cold in the right eye, for the relief of which, she went to a druggist, who treated her for upwards of a fortnight without benefit. When seen, the eye presented the following appearance. There was considerable conjunctival inflammation, but little sclerotic redness. A deep clear ulcer, the size of a large pea, was noticed at the inner edge of the cornea, communicating by a small round opening at the bottom of the ulcer with the anterior chamber, which was about one-third full of pus. The iris adjacent to the opening was adherent to the posterior layer of the cornea, and the pupil was small, but free. Paracentesis

was at once resorted to, and the whole of the pus let out; it re-formed, but was again let out, three days later, and has not since collected. The portion of iris which had been involved in the ulcer began to bulge, covered by a layer of lymph, so as to form a staphyloma. This was at once punctured, and snipped off level with the surface of the cornea, and pressure applied by means of a pad of lint, kept on by plaster and bandage over the closed eyelids. The general treatment was directed to ease pain and support the general strength. This patient is recovering, with some adhesion of the iris to the posterior lamina of the cornea, but with the pupil almost entirely free. When the ulcer had perforated the layers of the cornea, and the pus from it had dropped into the aqueous chamber, all that could be done was to limit the mischief as far as possible. There is little doubt that the gravity of the case was greatly increased by insufficient and unskilled treatment at the important early stage of the disorder, and by the weakness induced by nursing. It illustrates the advantages of operative procedure, as evidenced by the immediate benefit following paracentesis of the anterior chamber, and evacuation of the inflammatory products.

CASE 3.—Strumous Keratitis, with intense vascularity of the Cornea, and deposit of Lymph between its layers. A young girl, aged 16, began to suffer from great intolerance of light, and the upper part of the left cornea was observed to be inflamed, the result it was supposed of a slight blow. After the disease had lasted four or five weeks, and various remedies had been used without apparently checking the spread or intensity of the malady, the eye presented the following appearance:—The eyelids were puffy, swollen, and excoriated at their edges, from the constant flow of tears; the conjunctiva was inflamed, without being chemosed, and the cornea was obscured over the upper and outer two-thirds of its extent by a deposit of lymph in the layers, whilst the surface was intensely injected, particularly at the part covered by the upper eyelid. The tension of the globe was also increased, though not greatly; the

ciliary muscle was divided, under chloroform, opposite the seat of greatest vascularity, and warm soothing collyria applied for several days, the eyelids being kept closed by pads of lint and strapping. Improvement was noticed the next day, and the case progressed steadily to recovery, without any repetition of the operation. In this case, the use of the chloroform (the effects of which lasted for some time) prevented the patient from experiencing the severe pain which is often felt when the inflamed sclerotic coat is punctured.

CASE 4.—Diffused Suppurative Keratitis. A tradesman's wife, aged 45, who had been attacked with ptosis and paralysis of the internal rectus muscle of the right eye, accompanied by loss of sensation over the right side of the head, and impairment of vision in the same eye from which she had nearly completely recovered, caught a severe cold. She did not come under my observation for nearly a week, when the right cornea looked muddy over its whole surface. At the lower part, the anterior layer was stripped off, and its place occupied by stringy pus. In other parts, pus had begun to show itself between the layers. The conjunctiva was cedematous, the globe tense and painful, and there was only faint perception of light. There was every appearance of suppuration of the eyeball being set up. The ciliary muscle was at once divided, and the anterior layer of the cornea punctured with a broad needle wherever pus had formed. Two days afterwards, the operations were repeated, and again, after the lapse of three more days. The result of the treatment was, that the suppuration was arrested, the tension diminished and pain relieved, whilst a rim of clear cornea was preserved, through which it may be possible to make an artificial pupil hereafter. The only part where the cornea gave way was at the point where the pus first collected, but no staphyloma followed. Here, the severity of the attack and extent of the mischief, coupled with the previous malnutrition of the part consequent on the paralysis, at first seemed to render the case hopeless, and the saving of even the globe from suppuration and subsequent atrophy, almost vain, after a week had been allowed for the disease to run its course

unchecked. Probably, had earlier application been made, perforation of the cornea and purulent infiltration of the layers could have been prevented.

CASE 5.—Recurrent Scleritis. A man, aged 35, a ship carpenter, who had frequently suffered from rheumatic inflammation of the eyes, but who at the time of application was free from any rheumatic pains, when first seen complained of severe aching pains in the left eye and eyebrow, which had deprived him of sleep for several nights. The sclerotic was congested, extremely tender to the touch in the ciliary region, and very sensitive on exposure to light. The tension of the globe was slightly increased. The iris was not altered in appearance, but its movements were rather sluggish. He could only read No. 10 of Jaeger's type with great difficulty; application of leeches and other remedies gave no relief. I therefore divided the ciliary muscle at the upper part, below the eyelid. At the time, the operation caused great pain, which subsided in the course of two hours, and he slept well that night. Three days afterwards, I saw him again, when he could read No. 6 Jaeger well; the pain and tension were greatly relieved; he could sleep and eat well. He went on improving for nearly a week, when, having carelessly exposed himself to a heavy shower of rain, all the symptoms returned with increased severity. The muscle was divided a second time, but, in consequence of the relapse so soon after the subsidence of the former attack, recovery was slower. The internal treatment adopted was the administration of turpentine in 15 minim doses every six hours, with occasional purgatives. Warm opiate washes were applied frequently to the eye, and a pad of lint soaked in the wash, for two or three days after each operation. He recovered perfectly in about three weeks after the relapse, and was quite free from any trace of the inflammation.

CASE 6.—Chronic Recurrent Iritis, with closed Pupil. The patient, a woman, 84 years of age, had suffered from repeated attacks of iritis in both eyes, which had injured the texture of the iris, and had caused almost complete closure of the pupils.

She could still see well enough to find her way about the streets and in her own house, when a fresh attack came on. The remedies which had proved useful on former occasions, produced little effect. Partial alleviation of the pain was followed by relapse, and it was therefore determined, after the ordinary treatment had been persevered in for several weeks without subduing the inflammatory symptoms, to perform iridectomy in both eyes. This was accordingly done upwards, in the manner previously described, with the effect of freeing the patient from pain, loss of sleep, and the whole train of inflammatory symptoms, within a week. As the attacks of iritis were apt to recur, and so to produce closure of the new pupil, it was thought advisable to remove a large piece of iris, about one-fourth; and, as the greater portion of the gap so made was covered by the upper lid, the size of the new pupil was scarcely noticeable.

CASE 7.—Acute Glaucoma. A farm-labourer, aged 52 years, was attacked suddenly with intense pain in the right eye, extending to the back of the head, as though his eye was being forced out. At the same time, he noticed that things looked very dim. He could not sleep for several nights. He was treated antiphlogistically, on the spot, with the effect of slightly relieving the pain; but, as the sight appeared to get worse rapidly, he came to Liverpool. On examination, the eye-ball was very tense, the power of vision was limited to the perception of bright objects, or light; he could not read type of even the largest size, No. 20 Jaeger, and the left eye felt weak, he said. He was, as might be expected, much reduced by the pain and loss of rest. It was at once determined to iridectomise the right eye. About one-fourth of the iris was removed from the upper portion, with marked benefit. The symptoms above enumerated steadily abated, and he began to perceive the outlines of persons and objects, within a fortnight from the time of operation. In this case, no other treatment would have availed to save the eye, nor would a good result have occurred if the operation had been delayed. In no disease of the eye is delay so dangerous as in acute glaucoma; and wherever a patient complains of the above-

named, or analogous symptoms, no time should be lost in urging him to submit to an iridectomy at once. Patients are, from time to time, seen by oculists, who have either refused to undergo an operation, or who have not been warned of the fatal consequences of loss of time in this disease. If the early opportunity is lost, and the patient waits until he feels the beginning of the same symptoms in the other eye,—it may be this time in a more chronic form,—it is almost always too late for iridectomy to save or restore any sight in the eye first affected; and as regards the chronic form of glaucoma, this operation is seldom followed by such good results as when it is resorted to in acute glaucoma, since the delicate structures of the eye have been undergoing slow destructive changes of structure, and cannot be restored, even when the tension which caused the injury, is taken away.

ON SEA SICKNESS.

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It is a common opinion that little or nothing can be done to alleviate sea-sickness ; or, as it is said, there is no *cure* for it. Frequently the ship surgeon is not applied to until the sufferer is alarmed at the extreme degree of exhaustion to which he or she is reduced. My experience would lead me to the conclusion that in most instances very great relief may be afforded, at all stages of the affection, by the judicious use of medicines, carefully regulated diet, and other measures. The subject of sea-sickness has not received the attention it deserves from those who have the greatest opportunities of observing it, and the greatest facilities for its treatment ; namely, surgeons to passenger vessels.

Since my own observations were made, however, I have met with one or two excellent papers on sea-sickness*, the authors of which seem to have rightly appreciated many of the symptoms of this malady, and have given some valuable hints as to its treatment. There still appears to be room for further work in this direction, for it is only by the analysis of accumulated experience and observation, that the nature of diseases and their appropriate treatment can be determined with any satisfaction. When we consider the serious, occasionally fatal, consequences of sea-sickness, and the obstacle which it presents to crossing the water to pleasure and health-seekers and business-men, it will, I trust, need no apology for inviting attention to the subject, and recording my own experience of the malady, and what appears to me to be its rational treatment.

* Dr. F. W. Fisher, on Sea-sickness. *Dublin Medical Press*, December, 1847. Dr. John Alston, on Sea-sickness. *Glasgow Medical Journal*, January, 1868.

Sea-sickness might fairly claim a place in our standard works on medicine, but it is with one or two exceptions excluded from these; and it is not uncommon for young surgeons, immediately after passing their examinations, to take medical charge of hundreds of passengers, without having any idea of a disease they will be so soon called upon to treat.

The ordinary symptoms of sea-sickness are well known.

There is sudden giddiness, slight at first, but increasing with the rocking motion of the vessel. There is also a distressing feeling of weight and uneasiness about the epigastrium. These may be the only symptoms, if the weather is not very boisterous, but in long passages, the cause usually continuing to operate with increasing intensity, nausea and vomiting speedily follow.

The first accession of vomiting may be accelerated by some slight exciting cause,—if we may consider anything but direct irritation of the stomach to be an *exciting* cause,—as the sight or smell of food, the smell of tobacco-smoke, or a sudden whiff of the oily heated air from the machinery and furnaces, which acts as an effectual emetic when added to the disposition to be sick. Should the voyager retire to his berth, the breathing and smelling of the peculiar close air of the cabin, the sounds from the sick which greet his ears, and the sight of the basins and other preparations for a sick bout, all combined, increase the tendency to vomit.

Some slight relief is experienced after vomiting once or twice, but usually the patient, as we may now consider him, is not let off so easily. The food remaining in the stomach is first rejected, and afterwards a greenish-yellow gastro-bilious matter, which is often thrown up in large quantities. The salivary secretion is much increased. The frequency of the attacks of vomiting at first appears to bear some relation to the pitchings or rollings of the vessel, or as an American writer expresses it, “the heave interiorly corresponds to the heave exteriorly.” Diarrhœa occasionally occurs at this stage; more usually constipation is present throughout. The greater or lesser irregularity of the ship’s motion has also a sensible effect in determining the degree of sickness.

With a short chopping sea, in a small steamer, very few landmen escape, even though the rolling of the vessel be inconsiderable.

Many persons cannot travel by railway without experiencing uneasy sensations in the stomach ; but here, the motion being of a tolerably regular kind, vomiting does not commonly occur.

After the rejection of the food it contained, the stomach is irritated by its own juices and the bilious matter which is poured into it. These *digestive fluids* continue to be secreted in large quantity, and, having no food to work on, appear to act as direct excitants to the stomach, which rejects them as they accumulate ; hence the prolonged and distressing retching. This will be referred to more fully, when speaking of the pathology of the disease.

Short intervals of rest are obtained when the stomach is *entirely empty*, but as soon as the gastro-bilious matter collects, retching again occurs. The straining may be so great as to cause vomiting of blood

The sensations of the patient are miserable in the extreme. He lies almost inanimate, except when compelled to vomit, seemingly indifferent whether he may live or die. His extremities are cold, and he complains of numbness over the surface of the body. I have frequently observed great sopor at this period of the sickness ; the patient lies in a heavy stupid sleep between the accessions of vomiting. Some rest is doubtless obtained in this manner, but the patient awakes for a moment, feeling cold and miserable, not possessing sufficient energy to put on additional covering, and, after vomiting, again relapses into sleep. It would seem as if the will to move were paralysed. From twelve to fifteen hours out of twenty-four may be passed in this sleep. The urinary secretion is usually diminished. In favourable cases the vomiting and nausea subside spontaneously, and a ravenous appetite succeeds to the loathing of food before experienced. In other instances the vomiting or retching continues, nothing but greenish gastro-bilious fluids, with mucus, being rejected, fairly exhausting the invalid by its frequency, and by rendering him unable to take food. The exhaustion may be so great that the patient's life appears in imminent danger. His sufferings are increased by thirst, headache, and spasmodic pain in the stomach. Following the stage of coldness of the extremities, and pallor of the face, there is occasionally

a good deal of feverishness, a flushed face, hot skin, and furred tongue, and the urine containing lithates. The duration of the sickness depends in a great measure on the greater or lesser susceptibility of the patient to it, and partly on the treatment. Many old sailors never entirely overcome this susceptibility, and suffer if the sea is at all rough.

In voyages of more than a week's duration, presuming that passengers get sick on the first day, a small number will have recovered on the third day, and the majority by the fourth or fifth. Women suffer more severely than men, as a general rule. This, however, is in part owing to their remaining so long in their berths, while the men go earlier on deck. Infants, very young children, and old people are said to escape sea-sickness; and so far as my experience goes this observation is correct. Some persons do not entirely recover until their arrival in port. In these "chronic" cases, the patients suffer most in the morning and early part of the day, while in the evening they may be tolerably well. Sea-sickness usually terminates in recovery, but great debility may ensue from it and continue for a very long time. I have known it to terminate fatally, although not in the cases under my own observation.

The exertion of vomiting is not without danger in the case of pregnant women. M. le Coniat, of the French transatlantic mail packets, states that he has seen five cases of abortion in thirty-eight crossings.* This does not seem a large number; but in order to estimate the relative frequency of abortion, it would be necessary to ascertain the total number of pregnant women on board. Dr. Alston† and M. le Coniat* have observed, that on sea the menstrual periods are more frequent than usual. The secretion of milk is often arrested in nursing women, occasioning great trouble with the infants. The constipation, which is such a constant symptom, usually disappears when the patient begins to take food; it may, however, require medicine for its cure. Sometimes it is followed by

* *Arch. de Med. Navale*, Nov., 1868, quoted in the *Medical Times and Gazette*.

† *Glasgow Medical Journal*, January, 1868.

a sharp diarrhoea of an irritative character, occasioned probably by matters remaining in the bowels from the commencement of the sickness. A weak and irritable state of the stomach, resembling sub-acute gastritis, may remain for a long time after the sea-sickness proper is cured.

Pathology. The immediate cause of sea-sickness appears to me to be referable to the shock, or the series of shocks, to the nervous system, produced by the motions of the vessel. The action of the heart is deranged through reflex influence, and the cerebral and general circulation partake of the universal depression causing anæmia of the brain and enfeebled circulation throughout the body.* The giddiness and faintness are the result of the deficiency of the blood supply to the brain. To the general shock may be added that conveyed to the nervous centres by the momentary displacements of the viscera, especially the stomach, and that caused by the feeling of insecurity when the vessel begins to roll. The stomach is also affected through reflex action, and is rendered unfit to digest the food it contained, and which it accordingly rejects. The first effects are really beneficial; the circulation is lowered, and has time to adapt itself to the varying positions of the body, and the stomach is emptied of indigestible food. A precisely similar condition may be induced in some persons, by the motion of a railway carriage, or of a common swing.

Shock produces the sickness in the first instance, and this cause continues to operate until the patient becomes *habituated* to the

* Dr. F. W. Fisher believes that there is anæmia of the brain, and that the diaphragm is excited by sympathy to contractions, producing vomiting. *Dublin Medical Press*, 15th December, 1847, p. 376.

Dr. John Alston believes "the true nature of the disease to be functional derangement of the brain-mass, produced by a constant succession of slight shocks to which the nervous centres are subjected." *Glasgow Medical Journal*, January, 1863, p. 446.

Dr. Darwin ascribes sea-sickness to a disturbance of the brain consequent on the unusual impressions produced upon the vision by the motions of the vessel. *Wood's Practice of Medicine*, 3rd edition, vol 1, p. 562.

The impression on the vision has, I consider, some effect in causing sea-sickness, by contributing to the shock of the nervous system, but its influence is less than Dr. Darwin supposes.

movements of the vessel and insusceptible to the shock. This may be called the first stage of sea-sickness. But here other sources of irritation come into play, and retard the recovery which nature endeavours to procure. The stomach is weakened by the exertion of vomiting, as well as by the shock, in which the whole system participates. One of the effects on the stomach of shock, is to exalt its sensibility to a high degree, rendering it intolerant of the presence of any substance, so that it is quite unable to receive food, and the patient loathes the very sight of it. The gastric juices appear to be secreted very actively, probably from the irritation of the stomach produced by its being thrown about with the unusual motion.* These secretions would, under other circumstances, be employed in digesting food, and, having performed that office, be again absorbed into the system, or rejected with the excreta. Their normal function being suspended for want of material to work on, the supply of digestive force is in excess of the demand, and their influence is expended in irritating the stomach until rejected by vomiting. And although a slight effort would be sufficient to effect this, yet on the first attempt to vomit, at each accession of that process, a spasmodic action of the stomach and of the muscles engaged in vomiting occurs, until the *fit* of retching has ended. This, the second stage of sea-sickness, may last for a variable time.

The re-action of the gastric fluids is very acid, reddening strongly blue litmus-paper. There is therefore a quantity of acid fluid of an irritating character being poured into the stomach, and one indication of the treatment is to neutralise its acidity, by which means its irritative qualities are lessened. With this intent alkalies are given, as will be seen when we come to speak of treatment. The giving of alkalies refers only to the time that the gastric fluids are free in the stomach, and continue to be vomited; for afterwards, when all vomiting has ceased, there is a deficiency of acid in the gastric fluids (in consequence of so much having been rejected) to digest the food *which the patient is now able to take*.

* It is possible that the gastric juices proper are vomited in a crude and imperfect condition, unless we can suppose that the stomach is able to form elaborated gastric juice in such a short time as elapses between the vomitings.

And at the commencement of convalescence, patients almost invariably crave for acids (to supply the deficiency), such as pickled meats, lemon juice, acid wines, etc. Some have a great desire for common salt.

That the *continuance* of the sickness is due in a great degree to the irritation produced by the digestive juices on the empty stomach, receives confirmation from the fact, that ladies and delicate persons, even after several days of sea travelling, and when they consider that they have become quite accustomed to the sea, frequently experience a return of sickness on awaking in the morning, when the gastric secretions appear to be in excess; a quantity of gastro-bilious matter is vomited, and the sickness ceases *for the day*, as soon as they have taken food. This form of sickness occurs in many persons, however, without their going to sea. Violent, or even moderate, exertion before breakfast will with some bring on nausea, or vomiting (of gastro-bilious fluids).

The influence of what physiologists call *habit*, in its power of enabling the body to tolerate at length the sudden changes of position, which in unaccustomed persons produce sea-sickness, is here seen in a remarkable manner, and is as difficult to explain in this instance, as in many other examples of its effects. Habit appears to be the power which the system possesses of immediately *giving out* and *directing* nervous force, in obedience to constantly or frequently repeated demands for it under similar conditions. It appears strange that the body should, in the case of sea-sickness, be (at first) so little tolerant of a sudden change of position, while in gymnastic exercises, for instance, every conceivable change of position is experienced without any effect on the stomach. And towards the end of a moderately long voyage, those who were the first to suffer when the vessel moved out of port, can now walk the deck with an air of enjoyment and a steady gait, as the ship rolls and pitches. From *habit*, the heaving of the ship ceases to produce a shock, the stomach is unaffected, and the muscles are enabled to balance the body according to the movements of the vessel.

The only explanation one can suggest is, that in the former case the will of the individual is not called into play as the directing power—the nervous system is taken by surprise, and has not time

to adapt its emissions of nerve-force to the new state of involuntary motion of the body. In the case of gymnastic exercises, the will directs the movements, and the whole system is prepared for the change; and in that of the habituated sea-traveller, the change is expected, or *perceived simultaneously with the change*, and nervous force sufficient to resist the shock is instantaneously supplied throughout the system. We may judge of what occurs in those parts of the economy presided over by the organic or involuntary nervous system, by what we see taking place in those more directly under the control of the will. Thus, in standing or walking on board ship, the habituated sea-traveller almost insensibly, and with scarcely an effort of the mind, instantly inclines his body to the right as the ship rolls to the left. This facility of adapting the position of the body to the varying motions of the ship is termed by sailors "having one's sea legs." At the commencement of the voyage it is quite a study to keep one's balance, even with those who do not suffer from sea-sickness. The supplying and directing of nervous-force, as controlled by the will, can be understood from an illustration occasionally quoted in the physiological lecture-room. If a person attempts to lift a heavy substance under the impression that it is very light, he will probably fail altogether, or raise it a short distance and let it fall; but if he has an idea of the weight beforehand, he may be able to lift it with comparative ease. In the one case, the nervous system is taken by surprise, and the requisite amount of nervous force is not developed. In the other, the nervous system is forewarned, and prepared for the demand made on it.

There are a few fortunate individuals, who appear totally insusceptible to the shock producing sea-sickness, no matter how rough the sea may be.

Whatever be the state of the nervous system which protects the habituated voyager from shock, it continues in a greater or lesser degree, so as to produce the sensation of heaving (as observed by Dr. Alston), for some time after land is reached. The state of motion, which at first was abnormal, has now *from habit* become normal, and nerve-force continues to be directed to the requirements of a condition which no longer exists.

Having discussed in detail the symptoms and pathology of sea-sickness, we may now venture to give a definition of the malady.

Sea-sickness may be defined as a peculiar condition of the nervous system, produced by shock, resulting from the motion of a ship. The most prominent symptoms are a state of general depression, giddiness, vomiting, and derangement of the bowels and urinary secretion.

Treatment is in accordance with the views expressed as to the pathology of this affection. Such means should be used as would tend to lessen or counteract the nervous shock, and sustain the system during its continuance, and attention should be paid to the stomach, bowels, and other organs, and to the individual symptoms as they arise.

Before undertaking a voyage, the diet should for some days be light and non-stimulating. Alcoholic drinks, if taken at all, should be used sparingly.

If this regimen be followed, aperients and "blood-cooling medicines," so often used, will not be necessary. Some of the worst cases I have seen were men who had indulged rather freely in eating and drinking before starting, and had spent the night previous to their departure in a cup with their friends. Great bodily fatigue, from want of sleep, etc., should be avoided, so that the traveller may be able to cope with the sickness with his whole strength. After going on board, the voyager should remain as long as possible on deck, where he will have the benefit of the fresh air and also become more easily accustomed to the changing positions of objects. The shock conveyed through the medium of vision is thus lessened and the feeling of insecurity dissipated; or, as a passenger said to me, "by remaining on deck you know where you are, in the cabin you cannot tell the ceiling from the floor." Unfortunately, on the first sensation of giddiness, the deck and fresh air are deserted, and the women, and many of the men too, lie helplessly in their berths, until a particularly calm day induces them to venture forth. It is recommended to walk briskly up and down the deck, or to engage in some laborious exercise, such as pulling the ropes with the sailors, etc., and these means will

certainly aid in overcoming the sickness. They are only applicable, however, in a very limited number of cases, as in yachting; and those who work hardest escape best. While these measures will lessen the violence of the sickness, it seems necessary that some vomiting should take place, to lower the circulation and relieve the stomach of food which it cannot digest, as already explained.

There is no remedy for sea-sickness equal to the fresh sea air, and the occasional sprinkling one gets from the spray is very grateful and reviving. Let the sea-sick patients, therefore, by all means remain on deck, if the state of the weather permit. If the patient is a lady, she should be warmly wrapped up in shawls, and recline on cushions placed on the deck. The recumbent posture is the natural position of rest, relieves the giddiness by favouring the flow of blood to the brain, and gives the greatest ease to the stomach. A patient will thus frequently remain tolerably well all day, and only experience a return of the sickness on retiring to her room for the night.

The best way to secure the advantages of the fresh air, and at the same time to have the means of reclining comfortably, is to procure a room on deck, when possible. The patient may then leave the window open and remain in bed, if it is too cold or too wet to go on deck. During the summer months this may usually be done with safety and comfort, but in winter, on the American passage, the sea is sometimes too heavy, and washes over the deck, so that rooms below are preferable. As much time as possible, however, should be spent on deck. In the centre of the vessel the motion is least, and those are fortunate who can secure berths amidships. Other measures of great value are, to roll a binder firmly two or three times round the middle of the body; this appears to lessen the spasmodic action of the stomach and muscles engaged in vomiting; and if the patient be in his berth, he should lie on his back, with the head low, fixing himself as firmly as possible by making his head touch one end of the berth and planting his feet against the other, so as to become as it were a part of the vessel. Some however, obtain most relief by lying on the side, or on the face.

In very severe cases a hammock bed may be used. As

regards medicinal treatment, sedatives, anti-spasmodics, and diffusible stimulants are indicated. I have found such combinations as the following very useful.

Sodæ Bicarb., gr. 10.

Tinct. Valerian Ammon. m. xv.

Spir. Chloroform, m. xx.

Tinct. Lavand. Co., m. xx.

Mucil. Acaciæ, ʒi. ss.

Aquæ Camph. *ad* ʒi. ss.

A draught of this kind to be taken every hour, or every second hour. The soda and ammonia are given to counteract the irritating acid secretions in the stomach. The spirit of chloroform should be stronger than the officinal, so as to give from 5 to 10 minims of chloroform for a dose. The valerian has an excellent effect. Hoffman's anodyne and hydrocyanic acid may also be very advantageously used. I have tried bromide of potassium, but my experience of it is not sufficient to enable me to form an accurate estimate of its effects. I think, however, it would prove a useful remedy. External sedative applications to the stomach especially in "chronic" sea-sickness, are productive of good effect; as

Liniment of Chloroform,	} equal parts.
Liniment of Aconite,	
Liniment of Camphor,	

M. le Coniat employs faradisation of the epigastrium, and applies a solution of sulphate of atropia over that region. He states that this method has been very successful. I have no experience of it. The forehead and head may be bathed with Eau de Cologne, and the vapour of ammonia inhaled through the nose occasionally. Ice sucked slowly allays the thirst, relieves the clamminess of the mouth and throat, and is an excellent sedative to the stomach.

In cases of great restlessness and frequent vomiting, with inability to sleep, a full dose of opium, as recommended by Dr. Chambers, frequently arrests all these symptoms, if it can be kept down long enough to be absorbed by the stomach. Mr. Thomas Johnston recommends the subcutaneous injection of morphia;* and the

* *Medical Times and Gazette*, April 10th, 1869.

suggestion appears most valuable. In the subcutaneous administration, there is no danger of its being rejected by vomiting. Opium (like other sedatives) appears to act by diminishing the sensibility of the stomach, and rendering it less susceptible to reflex influence and the irritation of its own juices, but it cannot lay claim to be a specific.

These measures, followed up persistently for a few hours, will generally induce sufficient quietness of the stomach to enable it to receive food ; but it is necessary to ascertain what kind of food will be borne. Light semi-fluid food is best suited ; arrow-root is the best I know of to commence with ; it should be made with little or no sugar, and given in tea-spoonfuls at intervals of a few minutes. This can generally be kept down ; but even should it at first be rejected, the starch has a sedative effect on the stomach, and by degrees a portion is sure to remain.* The patient may now try some well toasted bread the carbonised portion of the bread acting as an absorbent of the irritating matters, together with some light soup without fat. It is highly important that a sea-sick patient, especially if very ill, should not be neglected. Efforts should be made, again and again, and at very short intervals, to induce him to swallow food after the first stage is past ; nor should this course be deviated from even if much of it is rejected by vomiting ; a small quantity will remain, and save the patient from the great exhaustion brought on by want of food and sea-sickness combined. When food is once retained and the gastric fluids fairly occupied, convalescence may be said to have commenced ; but the greatest care is still necessary with regard to diet. Thick chicken broth with a little of the meat* will be suitable, after which the patient may take something more solid. Most convalescents after sea-sickness crave for something acid, such as pickled fish, and salt meats with pickles ; and I have always gratified this *instinct* for acids, as I found that fresh meats were positively loathed and re-induced vomiting. The physiological reason of this desire for acids has been already mentioned. It is better to give acids with food

* The above line of treatment accords in the main with that proposed by Dr. Alston, in his excellent paper, viz. — Alkaline drinks to neutralise the acidity of the stomach ; and for food, beef tea and arrow-root, or sago.

than in a medicinal form. Food should at first be taken on deck, or where there is a free circulation of air; and the vicinity of the machinery and cooking department should be avoided. In the early stages, alcoholic stimulants, so commonly used, are injurious, increasing the tendency to vomit. In the second stage, and in "chronic" sea-sickness, with great exhaustion, stimulants are better borne, and may be given freely, as in other affections of great debility. Brandy, the acid wines, and in some cases champagne, may be given according to the patient's taste, which I found to be the best guide in selecting a stimulant. They should be iced. The irritative diarrhœa which often occurs during convalescence is usually cured by a dose of castor oil, which clears out offending matters; it is sometimes, however, exceedingly troublesome. The systematic treatment of sea-sickness applies rather to long voyages than to short ones. In voyages of less than twenty-four hours, the arrival in port and removal of the cause of sickness obviate the necessity of further treatment. For short voyages, the best that can be done is to be careful about diet before starting, to remain on deck if possible, to avoid alcoholic stimulants, and follow the general directions already given. It might appear difficult to carry out the foregoing rules of treatment in dealing with large numbers of emigrants, but the worst cases should be seen to by the surgeon personally, and the steerage stewards instructed how to act with others. A great deal of good may be done by making the emigrant passengers go on deck; indeed it is surprising how they can remain in the atmosphere of the steerage, an atmosphere which may be *felt* on sea-sick days, even with all the improvements in ship ventilation; yet it sometimes requires little less than main force to induce them to go on deck. There is every facility on board the steamers for giving them, when ill, any diet which may be ordered by the surgeon.

The practical test of treatment of disease is the result obtained. I have had every reason to be satisfied with the effects of the treatment here sketched out, while I have seen numberless failures from so called specifics.

Since the foregoing pages were written, I have become acquainted with Dr. Chapman's work on Neuro-Therapeutics and Sea-Sick-

ness. Dr. Chapman treats sea-sickness by the application of ice along the spine. He says that "experience has proved it to be peculiarly successful, precisely in those diseases in the treatment of which all known drugs have been proved most impotent; and to no disease is this remark more applicable than it is to sea-sickness." He holds "that the proximate cause of sea-sickness consists in an undue amount of blood in the nervous centres along the back, and especially in those segments of the spinal cord related to the stomach and muscles concerned in vomiting. All the nerves emanating from it partake of the increased activity of the cord itself, and convey from the centre to the periphery of the nervous system an abnormally large number of exciting impulses." These exciting impulses (he believes) result in a copious secretion of mucus in the stomach and bowels, vomiting, sometimes diarrhoea, and coldness of the extremities from the contraction of the minute arteries. Cold to the spine exerts a sedative influence on the spinal cord and the nerves issuing from it, as well as on the sympathetic trunks lying on either side of the vertebræ. The nervous currents are thereby lessened, and the various symptoms arrested. Dr. Chapman appears to have had great success by his mode of treatment. I regret that, in making my own observations, I had not the opportunity of employing this method; but from the fact of my not having done so, I am enabled to express the more strongly my dissent from Dr. Chapman's opinion that medicines are useless in sea-sickness, having had evidence of their good effects which I could not doubt. In sea-sickness, as in many other affections, we are often able, by the administration of medicines, to temporise, and keep the enemy quiet sufficiently long to allow the patient partially to recruit, and continue the combat with sickness on more equal terms. But there is no medicinal panacea for sea-sickness; each case must undergo a regular course of treatment, according to its particular indications; and the various nostrums and "infallible cures" for this affection have no other use than perhaps to allay the fears of the credulous voyager, until his stomach rejects them as worthless.

CLINICAL OBSERVATIONS ON SUB-MAXILLARY CELLULITIS,

BEING A LECTURE DELIVERED AT THE ROYAL INFIRMARY,
JULY 19TH, 1869,

By E. R. BICKERSTETH, F.R.C.S. Ed.,

HONORARY SURGEON LIVERPOOL ROYAL INFIRMARY, AND LECTURER ON SURGERY LIVERPOOL
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GENTLEMEN,

Our subject to-day is one of great interest. We have just left the bed-side of a patient in 19 Ward, who is now happily recovering from a condition which a few days ago was one of imminent peril, and who has been rescued from this state, I believe, by the prompt adoption of means which to many of you must have appeared extraordinary, but which in my opinion are essential for the safety of a patient under such circumstances.

The subject of our remarks suffered from diffuse cellulitis in the sub-maxillary region. Diffuse inflammation of the areolar tissue in the inter-muscular spaces extends, as its name implies, indefinitely in all directions; and, other things being equal, it is according to the extent and position of the affection, that danger is to be apprehended.

The disease may be idiopathic, but it much more commonly arises from injury, and is specially apt to occur from punctured wounds, into which some septic matter has penetrated, and after compound fractures and amputations. It has a close analogy to erysipelas, arising under similar circumstances and running a similar course; indeed it has been well described as a form of this disease. It may terminate in resolution, but more generally passes on to gangrene of part or the whole of the cellular tissue, and involves the destruction of the venous

trunks and capillaries in the immediate neighbourhood. Not unfrequently, as might be expected from this circumstance, (and specially when the cellulitis has followed compound fracture,) mortification of the whole limb occurs. Very often, we observe the first characteristic symptoms of pyæmia commence within a day or two of the period when decomposing sloughs have formed in the midst of cellular inflammation. And even if the patient has escaped these imminent dangers, the simple destruction of large quantities of cellular tissue, which invariably attends diffuse cellulitis passing on to suppuration, is so formidable a complication, that should the patient have sufficient strength to recover, the limb will probably be found a useless incumbrance. Such are the perils attending the latter stages of this disease. They do not arise till sloughing, suppuration, and decomposition are in progress, and this seldom occurs till after the fifth or sixth day.

But it is in regard to another danger that I desire to speak to you to-day, a danger that arises in the very earliest stages, if the inflammation is situated in the sub-maxillary region, and involves the areolar tissue about the base of the tongue. In this situation, the disease is often idiopathic; at any rate I have seldom been able to discover that any injury has preceded the attack. It is possible that some foreign substance, a husk of corn, a minute bone, or a piece of bristle, for instance, may have punctured the mucous membrane at the floor of the mouth, and been unnoticed. Nay, so rarely do we see diffuse cellulitis in other parts, without previous injury of some sort, that this is more than probable. However arising, the symptoms and appearances are very characteristic of the affection, and the inflammatory action is peculiarly prone to extend backwards, and cause cedema glottidis, sometimes indeed at a very early period of the disease.

Perhaps the best mode of putting the subject before you, and of impressing it on your memory, will be to mention a few cases, in the order they have presented themselves to my notice. Until the year 1861, I had never seen, or at least had never recognised, a case of this kind, but then one presented itself here under circumstances that I cannot forget.

CASE 1.—A man æt. 40, walked up to the Hospital one evening and requested admission. He spoke with great difficulty and indistinctness, so that it was impossible to obtain much information from him. His breathing was embarrassed. There was great swelling beneath the jaw. The floor of the mouth was raised, and the tongue pushed upwards and backwards against the roof of the mouth, so that no examination of the fauces could be made. Mr. Nash, who was the House Surgeon at the time, recognised the peculiarity and urgency of the case, and very properly requested my immediate attendance. In the mean time, he ordered the man some stimulants, and sent him to bed. I happened to be at home, and came up at once, when I was informed the patient had died suddenly a few minutes before. The following report of the case, and of the post-mortem examination, was drawn up by Mr. Nash.

A. B., aged about 40, was admitted, suffering from urgent dyspnœa with impending suffocation. The history was scanty, and difficult to obtain, on account of the precarious condition of the patient. From what could be gathered, it appeared that about three days before his admission, he was seized with rigors and severe pain in the sub-maxillary region, shortly followed by swelling, which prevented his swallowing with facility, and affected his breathing. He was only slightly inconvenienced at first, and therefore thought lightly of it, but, finding all the symptoms gradually increasing in severity, upon the third day he sought medical advice, and came here. Upon admission, the patient evinced a most painful expression of countenance. There was a distinct and uniform fulness in the front of the neck, extending from the lower jaw to the upper part of the sternum. The *pomum Adami* and trachea were completely obscured. The skin was tense, but was neither changed in colour nor consistence nor were its movements upon the sub-structures more interfered with than the tension would account for. Upon manipulation, a general solid condition of the deeper structures was felt. The tongue itself was healthy; but it, together with the floor of the mouth, was pushed considerably upwards. The patient was placed in bed, and took some brandy. Shortly afterwards, there was a sudden and severe exacerbation of

symptoms, so much so, that before the House Surgeon could be summoned, the man had died asphyxiated. *Autopsy.*—Shortly after death, a puncture was made with a tenotomy knife into the floor of the mouth, when a small quantity of air and some sero-sanious fluid escaped. Thirty-six hours after death, the neck was carefully examined. Nothing abnormal was discovered superficial to the deep cervical fascia, but beneath this there were evident traces of diffuse cellulitis. All the muscular interstices and the connective tissue surrounding the trachea was infiltrated with a sero-purulent fluid, extending upwards to the root of the tongue and downwards into the anterior mediastinum. The sub-mucous cellular tissue was also similarly affected, producing anteriorly the sub-lingual distension already alluded to, and posteriorly œdema glottidis and general œdematous laryngitis. The sub-lingual and the sub-maxillary glands were surrounded by inflammatory exudation, but their glandular tissue appeared perfectly healthy and natural. The tracheal mucous membrane was quite healthy.

Such was the first case that occurred in my experience. It was evidently one of diffuse cellulitis, originating among the muscles at the base of the tongue, extending downwards and causing death in three days by œdema of the glottis. The skin you will observe was somewhat tense from the swelling beneath, but was otherwise unaffected.

CASE 2.—On the evening of the 6th of November, 1862, I was requested by Mr. Parke, of West Derby, to visit with him a lady, and to bring with me my instruments, as the patient was threatened with suffocation. The friends gave me the following history. Though never enjoying vigorous health, the lady, a woman of full and stout habit, aged about 50, was generally tolerably well, and had not complained before the previous Saturday, the 1st inst. She then had several slight shivering attacks, felt ill, and complained of pain beneath the lower jaw, particularly on the right side. A little swelling was observed in this position, and attributed to inflammatory action in the sub-maxillary glands. The next day, (Sunday,) and on Monday, the swelling and pain had increased, and she had considerable fever.

The day following, (Tuesday,) the symptoms were more urgent, and there was difficulty in swallowing and in opening the mouth. A consultation was arranged, and on Wednesday, Mr. Stubbs saw and examined the case. There was then a considerable diffuse swelling, occupying the entire sub-maxillary space, and extending on either side beyond the angles of the jaw. The floor of the mouth was noticed to be raised, and by placing one finger in the mouth and another outside beneath the jaw, Mr. Stubbs thought he could detect an indistinct sense of fluctuation. Deglutition was very difficult, the articulation indistinct, and the constitutional symptoms severe. No fluctuation could be felt by pressure outside; still Mr. Stubbs felt confident that the next day it would be evident, and requested Mr. Parke to open it as soon as possible. The next afternoon Mr. Parke was called, as the patient had shortly before become much worse. He found her breathing with difficulty and the swelling larger. The difficulty of breathing increased, and at 10 p. m. I was requested to see her. I found her in great distress; the head thrown forwards, the face inclined upwards. She was sitting up in bed supported by pillows. She breathed with great difficulty, owing evidently to obstruction at the back part of the throat and about the glottis. Her countenance was suffused and dusky, the lips blue, skin moist, pulse weak, between 130 and 140. The whole of the anterior and lateral parts of the neck were much swelled, so that the space between about an inch below the skin and the sternum presented a decided convexity. The swelling extended laterally on each side to the parotid space; above, it was limited by the base of the jaw bone. Below, it gradually subsided over the upper part of the sternum and inner third of the clavicles, which were lost in the general tumefaction. The skin of the neck was everywhere of a bluish dusky colour, but not inflamed nor thickened, nor cedematous. On making pressure with the hand, the swelling felt soft, and yielded readily, except at the upper third, where, corresponding with the sub-maxillary space and across the whole width of the neck, the parts beneath the skin felt very firm, tense and unyielding. On examining the state of the mouth, which was accomplished with some difficulty owing to the patient being unable to separate the teeth beyond a very

limited extent, the mucous membrane of the floor was found to be raised to a level with the top of the lower teeth, of a deep purple colour, and cedematous. The tongue itself was not enlarged, but pushed upwards and backwards towards the back of the mouth. On feeling the floor of the mouth, it felt soft, and yielded readily to pressure, but I could not detect fluid, either with the finger in the mouth, or assisted by the hand pressed on the outside at the same time; neither could I feel from within the firm resisting swelling in the sub-maxillary space which I felt outside.

I regarded the case as one of diffuse cellulitis, involving, originally, the parts in the sub-maxillary space and about the base of the tongue; and, remembering the appearances presented in the previous case, I strongly suspected cedema glottidis had already come on. Suppuration had not yet taken place, or at any rate could not be detected; yet I considered a free incision to relieve tension and favour resolution, or possibly to give vent to some effusion, afforded the only chance of the patient escaping speedy suffocation. I dared not make any opening within the mouth, for I dreaded the consequences of increasing the difficulty of breathing that might arise from even a small quantity of blood in the fauces, in her exhausted state. I proposed to make a free and deep incision from the outside, and divide all the indurated textures down to the floor of the mouth and base of the tongue. Mr. Parke approved, and, the consent of the patient and friends being obtained, I proceeded to make an incision exactly in the median line, commencing about an inch from the point of the chin downwards, to the extent of between three and four inches. I divided the skin and fascia in the first instance, and then carefully and slowly cut deeper, keeping exactly in the middle line through hard dense structures to the depth of at least two inches. Then, introducing my fore-finger into the wound at its upper part, I found I had cut through the whole thickness of the induration, and that I had entered a cellular space beyond. Putting a finger of the other hand into the mouth I was satisfied I had divided everything except the mucous membrane of the floor of the mouth. At this stage of the operation, I fancied I heard air

escape from the incision, and accompany each expiration. I called Mr. Parke's attention to it, but before we could either of us be quite positive on the point the sound ceased. No pus or serum was seen to flow from the incision, and as I had only cut entirely through the induration at the upper part of the incision I then made the wound of equal depth throughout; but still I did not see any matter flow. The bleeding throughout was insignificant, and pressure with the finger deeply on one side of the incision soon controlled the little hæmorrhage that continued.

On recovering from the influence of chloroform, a decided improvement in the breathing was observed. The countenance appeared less suffused, and the lips less blue. The dusky blue colour of the integuments over the upper part of the chest was, moreover, decidedly less. After removing the patient to bed, and when all bleeding had ceased, a thin transparent brownish serum was observed to flow from the wound, and to collect again quickly when wiped away. Poultices of linseed meal were ordered to the neck, and changed every three hours. A draught containing liq. opii sed. 3ss. was given: wine and beef tea *ad libitum*.

November 7th.—Has passed a restless night. The breathing, though less difficult, is still very uncomfortable, and much impeded by mucus collecting in the mouth, which she is unable to get rid of. The difficulty and pain of swallowing is such as almost to render it impossible. Generally, every attempt is followed by violent cough and choking, arising apparently from some of the fluid passing into the trachea. The swelling of the neck is rather less, particularly at the lower part, and over the sternum, where it has decidedly diminished. No change is observed in the interior of the mouth. Countenance looks better and the patient expresses herself easier than yesterday. The great trouble is the pain and difficulty of swallowing. The same kind of fluid, but in larger quantity, is discharged from the incision. Pulse 130; tongue cannot be protruded.

November 8th.—Slept better last night, and feels better. Breathing more comfortable; pulse 110; skin cool and moist; countenance good; swelling of neck decidedly less at every part, and now much more localised in the sub-maxillary region. At

this part it still feels very firm and unyielding. A larger quantity of fluid is now constantly oozing from the wound, and it is more purulent in character. The act of swallowing is fully as difficult as ever.

November 9th.—Has slept very tolerably, and looks decidedly better. Breathing comfortable; swelling of the neck much less, and now confined to the sub-maxillary space. In this situation, apparently owing to the subsidence of the general tumefaction, the sub-maxillary and sub-lingual glands form three distinct prominences, the right sub-maxillary being the largest of the three. There is now a profuse discharge of thick brown pus from the incision. The articulation is more distinct, but swallowing is as difficult as before, the difficulty appearing to arise more from imperfect power to perform the act than from pain accompanying the attempt. As it seemed probable that, unless more nutriment could be taken than heretofore, the patient would be exhausted, beef-tea and brandy enemata were ordered, and arrangements agreed upon for administering food through a catheter, introduced through the nose into the œsophagus. The mouth can be opened better, and admits of examination. The mucous membrane generally is much swelled, of a dark colour, and covered with large aphthous patches.

November 11th.—Can swallow fluids much better the last two days. The swelling is decreasing, the discharge quite purulent, and very plentiful. Constitutional symptoms less severe. Can protrude the tongue about half an inch between the teeth. The swelling of the sub-maxillary glands is still very considerable, and feels very firm, particularly on the right side. The floor of the mouth less raised, and the mucous membrane generally looked healthier.

From this period, all progressed favourably. The discharge diminished, and with it the swelling. In the course of a week or ten days, the lady had fully recovered.

Here are two important cases, the first one fatal, and the second one saved, and saved apparently by adopting the means which had been unfortunately neglected in the first case, *i. e.*, a free and deep incision to relieve tension, to favour resolution, and to lessen the

œdematous swelling of the epiglottis, which in this affection is so likely to prove fatal.

The third case I shall relate very briefly. It is curious how these things happen in runs. It is now some years since I have seen a case of this kind, but at this time several occurred in my own practice.

CASE 3.—I was called by Dr. Falloon to see a young man, a draper's assistant, residing near the bottom of Manchester-street. There was diffuse cellulitis beneath the lower jaw. It had been preceded by a rigor, and was accompanied with difficulty in breathing, and trouble in articulation. I was called, as we often are in urgent cases, late at night. The swelling extended nearly from ear to ear, filling up the whole of the sub-maxillary space; the skin was not involved, but tense; the mucous membrane of the floor of the mouth was raised, and the tongue pushed upwards. As the distress was great, I suggested the importance of making an incision, but as it was late at night, and there was no gas in the room, I did not like to perform the operation with an uncertain light. I proposed it should be left till the next morning. In the meantime I left word that if he was worse I should be sent for. He got worse within a few hours, and before assistance could be obtained died suddenly, from suffocation, the result of œdema glottidis.

CASE 4.—Mr. Hutchinson, of Upper Parliament-street, asked me to see a gentleman, æt. 48, whom he had been attending for five days, and who was threatened with suffocation from acute inflammation in the front of the neck. The patient was a stout, plethoric man, and had previously enjoyed good health. Five days before, after exposure to cold, he was seized with a rigor, and shortly afterwards a swelling appeared, accompanied with pain and stiffness below the jaw. This continued to increase, in spite of treatment, and for two days before my visit had produced such distress that he had been unable to articulate or to swallow. For twenty-four hours, his breathing had been much embarrassed, so that he dared not lie down, nor attempt to rest. I found him propped up in bed, with his head thrown forwards and upwards, breathing laboriously, from accumulation of mucus in the fauces. The

floor of the mouth was raised, and the tongue pushed against the upper and back part of the palate. The whole of the front part of the neck was much enlarged, and presented a complete convexity, from the chin to the upper part of the sternum. The skin was tense, and of a dusky colour, but not inflamed. The enlargement was equal on both sides. It felt very firm and unyielding at the upper part, but was softer below. I could not detect fluctuation at any part. The pulse was 120 and full.

The suffused countenance, the difficulty in breathing, and the intensity of inflammation round the front of the fauces, were so indicative of immediate danger, that Mr. Hutchinson concurred with me in the necessity of adopting prompt measures for procuring relief. Accordingly, the patient being seated in a chair, opposite the window, I made an incision in the median line, from a little below the point of the chin, directly downwards for more than three inches. After the skin and fascia were divided, I cut slowly deeper and deeper through dense brawny structures to the depth of between two and three inches, and directly towards the base of the tongue. Then introducing my finger, I found I had entered a cellular space, and that a little sero-purulent fluid exuded. The bleeding was so slight, that no vessel required ligature. Immediate relief followed. The countenance improved, and the breathing was less embarrassed. That night he slept better than for several preceding ones. The next day the discharge from the wound was more profuse, and the patient was able to swallow some fluid nourishment. His recovery continued without interruption, and in about a fortnight he was able to go out and take exercise.

CASE 5. In the year 1865, a young man was admitted into No. 5 Ward, with a severe lacerated wound of the soft parts of the thigh, caused by machinery. Erysipelas followed, and the youth was much reduced, but was slowly recovering from its effects, when sub-maxillary cellulitis came on. It was of a comparatively mild and asthenic form, and caused so little increased disturbance of system, or difficulty in swallowing, that danger was not apprehended. Following an attack of erysipelas, I anticipated the formation of abscess, rather than the ordinary course of diffused cellulitis, and

watched the case closely, with a view to evacuate pus, as soon as I could detect fluctuation.

The floor of the mouth was raised, and the tongue pushed upwards, but there did not appear to be any impediment to the breathing, and he was able, though with difficulty, to take a fair amount of nutriment. For a week matters went on this way, not getting worse, but still without amendment. The distress was not so great as I had previously observed in these cases, and the exhaustion of system, consequent on long confinement, and an extensive wound, followed by erysipelas, was such that I felt anxious to avoid making any incision, unless it should prove to be absolutely necessary. So nothing was done beyond the application of fomentations and poultices, the administration of tincture of iron, and as sustaining a diet as possible. Nine days from the beginning of the attack, and without any increase in the symptoms, the man was seized during the night with a paroxysm of choking, and died suddenly before the house surgeon could be summoned.

On post-mortem examination, the epiglottis was found enormously enlarged, from cedematous infiltration; but there was little or no contraction of the rima, and no trace of inflammation of the larynx. The cellular tissue beneath the jaw, and among the muscles at the base of the tongue, was everywhere infiltrated with purulent matter, and *débris* of dead membrane.

I beg you will remember this case, for it was somewhat peculiar. I had hitherto held that difficult breathing, from obstruction in the neighbourhood of the larynx, was a principle feature of cedema glottidis, and that unless this symptom was present, we need not fear its existence; yet here, you will observe, there was but little trouble with the respiration. We have learnt by painful experience, that deep-seated cellulitis cannot long continue in this region, without great risk of cedema glottidis, and that delay in making the proper incision for its relief may prove fatal.

Now let us speak of the present.—CASE, No. VI. Sarah Broonall, æt. 19, a servant, was admitted on the 18th of July. She said that fourteen days before admission she caught cold, by getting her feet wet in washing, and her throat became a little swollen and painful. The next day this passed off,

and she continued well until July 12th, when the same symptoms returned as in the first instance, *i. e.*, difficulty in swallowing, from a swollen and sore throat. The following day she was admitted here, and had then a diffuse hard swelling beneath the jaw, extending nearly from ear to ear. On the 14th I saw her, and recognised the conditions I have spoken of. The swelling was much more on one side than the other, the right being the largest. The skin moved freely over the swelling. It was not inflamed, but stretched from the swelling beneath. She had great difficulty in articulation, and we could not understand a word she said. She was utterly incapable of swallowing, and scarcely able to separate her teeth. On getting her to open her mouth a little, we found its floor was raised to the level of the lower teeth and œdematous. The tongue itself was somewhat swelled, and pushed against the upper part of the mouth, so that it was impossible to get any examination of the fauces. There was, moreover, considerable febrile disturbance of the system. The distressed and anxious countenance, the inability to swallow, difficulty of breathing, and impossibility of articulation were so evident, that, from the experience I have derived from the cases just narrated, I had no question of the patient's imminent danger. I apprehended the extension of inflammatory exudation to the epiglottis and larynx, producing œdema of these parts, and leading to the suddenly fatal issue which occurred in three of the cases I have just described. Recognising this imminent danger, I made the free incision I have described, and which I believe ought to be made in all such cases when this risk exists. I say when this risk exists. Don't misunderstand me. In the early stage of this affection, when the swelling has only existed a few hours, or a day or two, when there is no great difficulty in swallowing or in breathing, when the tongue is not pushed up materially, nor the floor of the mouth raised, do not suppose I would at once advocate an operation. A milder treatment may then be tried: the application of leeches over the tumefaction, a sharp aperient, such as calomel and jalap, and soothing applications, fomentations, or linseed poultices. These means will very often, I am quite satisfied from experience, prove beneficial, and relieve the patient from the necessity of any

further treatment. It is only when milder treatment has failed, and when we meet with a case in the condition I have described to you, that an incision is required. Now a word about the situation of the incision. To cut merely through the skin will do little or no good. It is the deep cellular tissue that is involved. The incision, to do good, should go fairly through the whole thickness of the inflamed textures; and where can we do this with safety except in the median line? Only there can we divide the textures without dividing important blood vessels and nerves. Thus, although the swelling may be chiefly on one side, we make the incision in the middle line, its deepest part reaching inwards towards the epiglottis; and although the most intense inflammation may not be here, we approach the part where its consequences are most to be feared, and afford a free exit for the discharge of inflammatory fluids. This is the point then where the incision can be made with safety, and with good effect. It should extend from near the point of the chin, downwards, to the hyoid bone, and deeply upwards and backwards towards the base of the tongue. As far as my experience goes, whenever this has been done, it has not failed to relieve the patient from the danger I have mentioned. In fact, in every instance the patient has recovered. Remember the patient who had erysipelas of the thigh, and afterwards sub-maxillary cellulitis, in this hospital, where we watched him closely, always ready to operate, but never doing so. On this account I impress upon you the importance of making a free incision, in case the patient is not relieved by milder treatment. The case we are now considering had this incision made last Wednesday, and each day since has steadily improved. The same night she could breathe and swallow better, the swelling is falling fast, febrile excitement is diminishing, and she may be said now to be out of danger. No pus flowed when the incision was made. We hardly expected it would, for the inflammatory products are so infiltrated among the tissues that they do not escape at the moment of incision. The next day however, matter began to flow, and now the wound discharges freely.

I can hardly suppose you can confound sub-maxillary diffuse cellulitis, with glossitis or inflammation of the tongue, whether

acute or chronic. The two affections present entirely different appearances. In acute glossitis the tongue itself is enlarged, often enormously so, and of a deep purple colour. It is too large to be contained within the mouth, and therefore, besides filling up its whole cavity, generally protrudes somewhat between the teeth. There may be some swelling beneath the jaw, associated with this condition, but the essential feature is enlargement and inflammation of the tongue itself. In sub-maxillary cellulitis, on the other hand, the tongue is not enlarged, but pressed upwards against the roof and back of the mouth by the swelling beneath it.

It has been very commonly observed, on examination after death from laryngeal disease, that although death has evidently been due to suffocation, we seldom find the degree of contraction of the laryngeal orifice we should have expected. This is more especially the case, when the disease has been either as in croup or diphtheria of an acute inflammatory nature, or there has been ulceration which has suddenly become more acutely inflamed. We are apt to forget that the larynx is a highly sensitive organ, supplied with nerves and surrounded with muscles capable either of contracting or of increasing the laryngeal aperture. In the acute affections I have mentioned, the constricting muscles are irritated and spasmodically contracted, so that during life a greater degree of contraction exists than after death. In these affections we find relief is derived from opium, belladonna, and other narcotics which relieve spasm and lessen irritability. In other affections, such as œdema glottidis, and particularly the form of œdema arising from inflammations near to, but not in the larynx itself, the narrowing of the orifice is more passive; and in these cases, there is strong instinctive and voluntary effort on the part of those muscles, whose function it is to maintain the orifice open, to act. The patient dare not lie down or compose himself to sleep; if he were to do so, he feels he would surely suffocate; and probably he is quite right in this idea. Narcotics under these circumstances would do harm, by paralysing and lessening the sensibility of the muscles on the action of which his very life depends. But however strong the instinctive and voluntary effort may be, however effectually these efforts may overcome the œdematous

constriction for a time, the period during which they can be maintained is limited. Sooner or later the fatigued muscles are completely exhausted, and then death is the immediate result. Thus we can explain the apparently sudden dissolution in cases of œdema glottidis. The patient has often a tolerable pulse, and air in sufficient quantity appears to enter the lungs with each inspiration, there is perhaps no blueness of the lips, or lividity of the countenance, yet in a moment he may die from suffocation.

Do not suppose that I question the powerful action of those muscles which enlarge the rima glottidis when contracted, whatever the cause of the contraction may be. They act with all the power they can exert. In the one case, however, they appear to oppose muscles spasmodically contracted, but in the other a mere passive filling up of the orifice. Hence arises the different influence of narcotics on the two kinds of laryngeal contraction. But the important bearing of these observations is with regard to the period at which we ought to interfere by operation, in order to give relief to the sufferer, who is slowly, yet surely becoming exhausted, in consequence of laryngeal obstruction. Many times I have had cause to regret delay. Overlooking the history of long continued difficulty in respiration, I have regarded simply the apparent actual condition of the patient, and waited till too late to be of any avail. On the other hand, I may say I have never regretted being too prompt. The proper time to operate is when milder measures have failed to give decided relief, or immediately, if the distress is great, and has continued already for a day or two.

I must not close this lecture without cautioning you regarding the use of chloroform in operations under these circumstances. It is too great a boon to be lightly dispensed with, yet, if used at all, it must be with extreme caution. Chloroform acts like any other narcotic. It removes pain and distress, and takes away at once both the instinctive necessity and the power of action of the voluntary muscles, on which alone, perhaps, the continuance of respiration depends. Those of you who were here yesterday afternoon, had the opportunity of witnessing a well marked example of this. The patient suffered from tubercular ulceration

of the larynx, and was in such distress from impending suffocation, that he had not laid down or slept for several nights. He was brought to the Hospital to have the operation of tracheotomy performed, for it was evident he could not much longer continue the forcible efforts he was compelled to make in order to breathe. He walked into this room, and lay down on the table while preparations were made for the operation. His pulse was quite steady, and tolerably full, and, as he wished to have chloroform, I did not object. After a few inspirations, however, the breathing became slower, and less complete. The voluntary muscles on which his respiration mainly depended were becoming paralysed, the sense of constriction of the larynx, which compelled him to use these muscles, was benumbed by the chloroform, his pulse continued good, but the breathing became less and less complete, till within a minute or two, it altogether ceased. Of course the chloroform had been removed, he had not taken it altogether for more than two or three minutes. The pulse continued good for another minute or two, I opened the trachea instantly, and had just slipped in the tube, when the pulse was reported to have stopped. At this moment the man's appearance was certainly that of death—his eyes fixed, and the pupils dilating. One or two forcible compressions of the chest sufficed to re-establish respiration, and the pulse returned. The patient has since gone on favourably, and will probably recover. Yet the exhaustion consequent on his previous prolonged and forcible efforts are such, that whenever he falls asleep, his respiration becomes so slow and imperfect as to threaten dissolution, and I have therefore directed the nurse to watch him constantly, and to rouse him whenever his breathing appears to be failing. He is fed with brandy, beef tea, and eggs, and enemata of the same have been administered several times.

ABSTRACT OF THE PROCEEDINGS OF THE
LIVERPOOL MEDICAL INSTITUTION,
FOR WINTER SESSION, 1868-69.

I.—*Pathological Specimens exhibited.*

By Dr. BRAIDWOOD.

1. Specimens of foreign bodies impacted in the œsophagus. The first was a case in which a triangular piece of porcelain had been swallowed in some bread and milk, and had caused a small lacerated wound in the posterior wall of the œsophagus, having made its way into the posterior mediastinum, where it had caused an abscess. The chief symptoms were dyspnœa, dysphagia, and emphysema beginning on the right side of the neck. Another specimen was that of a handkerchief almost entirely impacted in the œsophagus, said to have been swallowed by a girl suffering from typhoid fever. A fish-hook was also shown, which had been swallowed, but had been removed by forceps, under chloroform.

2. A renal tumour, from a child, aged 22 months. The swelling had only been observed for three months, and had rapidly increased. Large veins coursed over the abdomen. There was great emaciation, œdema of the legs, and the urine became much diminished in quantity some time before death. The tumour weighed 10lb, and was of the nature of medullary cancer, affecting the left kidney and suprarenal capsule. A section presented various characters in different parts, and the microscopic appearances also varied; cancer-cells with renal tubes being present in one part, and granular matter, without cancer-cells, in another.

8. "Brain of a child, with a deposit of lymph upon it."—The child was seven years old, and about three weeks since vomited and became suddenly unconscious. There was heat of head, squinting, convulsions and rigidity alternating on opposite sides of the body,

the convulsions being sometimes general. Both the squinting and convulsions ceased some time before death. The *dura mater* was found adherent to the skull, and a layer of lymph, a quarter of an inch thick, existed on the surface of both hemispheres; brain substance softened; excess of fluid in ventricles; vessels congested and convoluted. Dr. Braidwood believed that there were collections of white corpuscles in the vessels of the grey matter, forming minute emboli.

By Mr. HARRISON.

"Atrophied bones of fore-arm," removed by amputation from a woman, aged 50, who was suffering from strumo-syphilitic disease of the face and right arm. The bones were diminished in length and circumference, the shortening being due to atrophy. The humerus was fractured just above its lower extremity, though there was no history of injury. The other structures were all converted into a fatty, gelatinous mass.

By Mr. BANKS.

1. "Diseased Spinal Cord," removed from the body of a young woman, who strained her back over the arm of a sofa while resisting a criminal assault. The chief symptoms were pain, pricking in the legs, and rapidly-developed paraplegia the day after the injury. Death occurred on the tenth day, preceded by alonghing, &c. The post-mortem examination revealed that the membranes of the cord were distended with serum, a small quantity of lymph existed under the arachnoid, and that there was complete disintegration and acute softening of the whole thickness of the cord, to the extent of half an inch. There was no apparent injury to bones or ligaments.

2. "Obliterated Arteries."—The patient was a young man in good health. His right foot became acutely inflamed, without any cause, and then gangrenous. The gangrene spread, and amputation was performed below the knee; the stump mortified, and death followed. Very little hæmorrhage occurred during the operation. On examination, the arterial trunks, from the bifurcation of the aorta as far as both popliteals, were found converted

into fibrous cords. The tibial vessels were pervious. Mr. Banks considered it a case of "Plastic Arteritis," and that portions of coagula, getting into the main branches of anastomosis, had prevented the collateral circulation being established.

8. "Malformed Foot."—The three inner toes and a large portion of the front of the foot were greatly hypertrophied, and the impediment it caused in walking necessitated amputation. The deformity was congenital.

4. Two specimens of "Senile Gangrene" of the hand and fore-arm, due to thickening and calcification of the arteries.

5. Two specimens of "Fractured Skull," with injured brain.—In one case a large quantity of brain substance had been lost and a "fungus cerebri" formed, while the lateral ventricles had been opened.

6. Portion of "Strangulated Intestine," which had been returned by operation, but had suddenly given way by two small openings through which the contents of the bowels had escaped. Death occurred from collapse.

7. "Uterine Tumour."—During life it presented all the characters of an ovarian tumour, and a large quantity of fluid had been removed by tapping. Ovariectomy was performed, but at the operation it was found that the tumour was connected with the upper and posterior part of the fundus of the uterus. It was determined to remove the uterus altogether. Death occurred soon after the operation.

8. "False Joint in the bones of the leg," from a child, in whom every means had failed to produce union.

9. "Osteo-cephaloma of the lower jaw," from a woman, aged 78. Many years ago she had had the lip removed for cancer, but the jaw had only been affected a few weeks.

10. A "Lamb's Head," presenting the monocular form of monstrosity.

By Dr. CAMERON.

1. "Aneurism of the arch of the Aorta."—The only prominent symptom was intense pain in the back, just below the left scapula,

also felt round the body, and in the epigastrium. There was dulness on percussion, but no bruit. The aneurism was about the size of a cocoa-nut, and occupied the whole of the posterior mediastinum. Four or five of the vertebræ were eroded.

2. Another specimen of "Aneurism of the arch of the Aorta."—The patient was a man, aged 40; he had been ill three months, the first symptoms having been dyspnœa and cough. After this the patient became unable to lie down, had stridulous breathing and aphonia. There was dulness on percussion in the upper sternal region and above and below the clavicles, but no murmur. The respiratory sounds were feeble on the left side. Death occurred suddenly from hæmoptysis. A small aneurism was found at the junction of the ascending and transverse portions of the arch of the aorta, and had ruptured into the trachea. The aorta was extensively atheromatous, and there were abundant apoplectic clots in the lungs.

3. "Kidneys containing small Abscesses," removed from the body of a woman, who had suffered from acute rheumatism, followed by a slight attack of diphtheria. The patient became very low and ill, suffered from vomiting, with great epigastric tenderness. Her urine became albuminous, and afterwards contained pus. Death occurred in three weeks. The kidneys were found highly congested, and a number of small abscesses existed in their cortical substance.

4. "Tubercular Lung, with rapid development of Emphysema." A patient, in the first stage of phthisis, suddenly suffered from urgent dyspnœa, followed by hæmoptysis. The physical signs gave evidence of emphysema of the bases of both lungs, but particularly of the left. The hæmoptysis ceased two days before death, the patient became livid, had orthopnœa, and his pulse was scarcely perceptible. Death occurred suddenly. Miliary tubercles existed in the upper lobes of both lungs, while their margins and the lower lobes were emphysematous. Dr. Cameron thought it was an instance of emphysema, developed from one part of the lung having to do extra work. Death was due to the obstructed circulation induced by the emphysema.

By Dr. DE ZOUCHE.

"Congenital dislocation of the Radius."—It existed in both forearms. The ulna occupied the whole of the articular surface of the humerus. Supination was rendered impossible.

By Dr. GEE.

1. "Aneurism of Abdominal Aorta."—The patient had been a soldier 21 years, and for two or three years had perceived a hard swelling in the region of the stomach. He also suffered from cough and dysuria. When first seen, the chief symptom was constant vomiting; a large tumour was felt in the epigastrium, which had no fluctuation, pulsation, or bruit, and seemed to be connected with the left lobe of the liver. Tubercles and vomices existed in the right lung. Death took place suddenly. A large aneurism was found close to the coeliac axis, pressing the stomach upwards and forwards, passing downwards between the folds of the peritoneum, and resting partly against the spleen, partly against the inner margins of both kidneys. A second tumour existed between the layers of the mesentery, full of coagulated blood, and there was a small rupture in it, allowing its contents to be discharged into the abdominal cavity, which contained a large quantity of coagulated blood. There was an opening in the aneurism, an inch by three-quarters, and communicating with the second sac.

2. "Abnormal Heart," removed from the body of an infant, aged five months, who had suffered from the usual symptoms of cyanosis. No murmur existed, and the heart-sounds were regular, distinct, and of equal duration. On examination it was found that there was a large patent 'foramen ovale;' the left ventricle was hypertrophied, and the aorta dilated; while the right ventricle was hardly discernible, and the pulmonary artery almost obliterated.

By Dr. SKINNER.

"Adherent Placenta."—It was a good example of phthysical placenta. The patient from whom it had been removed was the mother of three living children.

By Dr. BURTON.

"Diseased Heart," removed from the body of a little girl who had suffered from rheumatism and afterwards from scarlatina. The aortic and mitral valves were diseased, and the heart somewhat enlarged.

By Dr. RAWDON.

1. "A Heart, showing extensive disease of the Aortic Valves." The patient was 50 years old, and died of empyema.

2. "A Heart, exhibiting disease of both Mitral and Aortic Orifices." The former scarcely admitted the little finger.

3. "Stricture of Œsophagus at Cardiac end."—The patient was a man, aged 43. The principal symptoms were great dysphagia, emaciation, and pain in the epigastrium. The strictured part was not much thickened, and presented an ulcerated surface on examination. The lungs afforded evidence of long-standing phthisis. This patient had well-marked bronzed skin, but the supra-renal capsules were healthy.

4. "Cancer of Colon," from a woman, aged 46, who was suddenly seized with vomiting and constipation. Her bowels were freely relieved, but she gradually sank. On examination, at one part of the descending colon, schirrhous deposit was found. The bowel was distended above and contracted below this point. No cancer existed in any other part.

By Dr. DAVIDSON.

"Stricture of Urethra, with diseased Kidneys." — The patient had suffered for six months from gradually increasing dysuria. He died suddenly in a kind of fit. He had just returned from the West Coast of Africa. The stricture existed at the usual spot, and was permeable. There were several false passages. The kidneys were atrophied, especially their pyramidal portions, and their capsules were very adherent. The other organs were congested and the heart dilated. On opening the cranium, a quantity of gelatinous effusion was found beneath the arachnoid. Dr. Davidson believed that death was the result of some poison in the blood, either malarial, or due to suppression of urine.

By Dr. Lyster.

1. "Aneurism of the arch of the Aorta."—It caused extreme dyspnoea; and had produced caries of the spine from pressure. The physical signs were dulness behind the manubrium, and a diastolic murmur. The aneurism was very large, and a smaller one existed near the diaphragm. The heart was healthy, but the aorta presented atheroma and calcification.

2. "Cancer of the Intestines."—The patient, a woman, aged 50, had suffered for months from constipation and debility. Peritonitis set in. She vomited much, but the vomited matter was never stercoraceous. A large dilatation was found about the centre of the ileum, and a cancerous stricture below this; then a second dilatation and stricture; and then the intestine turned upon itself, and there was a third stricture. Cancer also existed in the meso-colon and pancreas. There was a perforated opening in the cæcum through which the fæces had escaped, causing peritonitis.

By Mr. Hamilton.

"Intestine in a case of Strangulated Femoral Hernia."—The hernia had existed from girlhood, the patient at the time of the operation being 58 years of age. There were the usual symptoms of strangulation. On opening the sac, a large piece of omentum was found, with a small portion of intestine not very dark; these were returned, but the vomiting continued, purging set in, and death took place in four days. The intestine was found in the peritoneal cavity, of a dark colour. A small, round, yellow ring existed at one point, which had almost ulcerated through, but there was no actual gangrene.

By Dr. Glynn.

"Calculus removed from the scrotum of a boy, aged seven years." It had formed very rapidly, producing a hard tumour. It was readily removed, and found to be contained in a thickened sac of cartilaginous consistence in front of the testicle, communicating with the urethra. It had probably formed on a nucleus of uric acid.

By Dr. ROBERTS.

1. "Urinary Calculi, with diseased Urinary Organs."—There had been symptoms of calculus and enlarged prostate for some time. The patient was admitted into the Northern Hospital in a very low state, and died in a few days, without any other symptom than debility. At the autopsy, the bladder was found to contain some thick white fluid, and three calculi, one about the size of a pigeon's egg, and the other two as large as beans. These were composed of uric acid. Bladder very much thickened and contracted, and its mucous membrane in an unhealthy condition. Prostate gland enormously enlarged, its middle lobe forming a large prominence with a deep pouch behind it. Kidneys small, contracted and nodular; presented a number of small superficial abscesses. The section was very pale, and there was hardly any distinction between the cortical and medullary substances.

2. "Diseased Heart."—The patient was a man, aged 61, suffering from extensive dropsy. Heart's action successively rapid and irregular, impulse very intensive, weak and jerking. Murmurs existed both at the base and the apex. The jugular veins pulsated and filled from below. Death resulted from peritonitis after tapping for ascites. Both lungs were extensively emphysematous. Heart weighed 22 ounces, being greatly hypertrophied and dilated. The tricuspid orifice admitted seven fingers. There was abundance of calcareous deposit in the aortic valves, and the mitral valves were atheromatous. Liver weighed 56 ounces, and presented a nutmeg appearance on section.

3. "Enlarged Heart," removed from a negro, who had suffered for two months from extensive general dropsy, from which he gradually sank. There was no history of rheumatic fever, or of any serious illness. The enlargement of the heart was found to be chiefly due to hypertrophy and dilatation of the left ventricle. It weighed 26 ounces. The valves were tolerably healthy, but the aorta was atheromatous. The liver weighed nearly 5 lbs., and was fatty.

II.—*Cases related or exhibited.*

Mr. HARRISON introduced a man, the whole of the inner portion of whose hand had been crushed on a railway, the thumb only

having been left entire. The case was exhibited to illustrate the importance and utility of the thumb alone.

Mr. BAILY alluded to a case, in which he had lanced a child's gums, and the bleeding did not cease for five days, having continued uninterruptedly for two days.

Dr. DESMOND reported a case of rapid development of fever from mental anxiety. A lady mentioned to a friend a case of typhoid fever she had seen. The latter lady brooded over it, declared she should be attacked with it, which proved to be the case, and she died.

Mr. WARBURTON brought forward the case of a child, who had died suddenly of hæmorrhage from the throat during convalescence from scarlet fever.

Mr. HIGGINSON mentioned a case of abscess in the neighbourhood of the parotid gland, opening into the mouth. An external incision was made, and the case did well.

Dr. TELFORD related a case in which a tumour was noticed immediately after parturition, by a midwife, and supposed to be a second child, but proved to be a large intra-mural tumour, about the size of an adult head. Death resulted from peritonitis.

Dr. GEE related a case of sudden death, in which the autopsy revealed a fusiform aneurism of the origin of the aorta. Its lining membrane at one part exhibited a slit extending through the internal and middle coats of the vessel, and at another point the external coat was perforated. Through this opening blood had escaped, and filled the pericardium.

Mr. HARRISON brought forward a case, in which an eczematous eruption on both feet, with discolouration of the skin, had resulted from wearing red silk stockings. The patient discontinued wearing them, and was soon well. Three dyes were found in the stockings, of a very injurious character, one being combined with an arsenical preparation.

Mr. CRAVEN described a case of "dislocation of the ankle, with fracture of the internal malleolus." The tendon of the tibialis posticus had slipped from its groove, and got in between the fragments, causing great pain on the least movement. On extending the foot backwards the tendon was felt to get free, and it was then

fixed in its place by plaster, and afterwards by gum and chalk. The fracture united, a slight depression being left, but there was little use of the foot, as much pain was caused by the least exertion.

Mr. BAILY mentioned a case in which a difficulty had occurred during delivery, in consequence of the external genital organs having become partly converted into skin. The forceps had to be used, and a partial rupture occurred.

III.—*Papers read.*

1. "On recent improvements in the Operative Surgery of the Eye," by Mr. BICKERTON.

The author, after precluding his remarks by a few general observations on the recent advances in this department, aided greatly by the employment of the ophthalmoscope and by scientific research, proceeded to describe the operative treatment of certain diseases of the eye, and exhibited the instruments required. These various operations were described in the following order:—Slitting open the puncta lachrymalia, and the use of Bowman's or Von Graafe's probes for stricture of the lachrymal duct. A mode of destroying 'nævi materni' on the lids was next explained. Dr. Williams' method of treating trichiasis with caustic potash; the most recent mode of operating for entropion; Liebrich's subcutaneous division of muscles for squint; and excision of the eye-ball, performed for the first time by Dr. Stoeber, in 1841, were fully explained. Mr. Bickerton stated that he had no faith in 'abscission of the anterior half of the eye-ball.' The operations for soft cataract, by making a small incision into the cornea and evacuating the lens at different times, and extraction by suction, were next detailed. The author analysed the various operations for hard cataract. Schufl's operation, he stated, had not given good results, and had been replaced by Von Graafe's modified linear extraction. By this latter method, Mr. Bickerton had obtained most excellent results. The various sources of origin of capsular cataract and its treatment were then explained. The object in making an artificial pupil, and the modes of operating, by removing a portion of the iris, by withdrawing a por-

tion of the iris (termed iridodesis), and by incision of the iris, were next discussed. The author strongly advocated iridectomy. He stated that, in performing this operation he seldom gave chloroform, and used Graafe's narrow 'extraction knife.' He had also operated by making a conjunctival flap, as in the 'modified linear extraction' operation, and had had satisfactory results. In considering the relative practical value of iridectomy, division of the ciliary ligament, and division of the ciliary muscle, he expressed the opinion that each was very useful in properly selected cases. The operations for puncturing the eye-ball were fully entered into; and finally the evacuation of effusions between the retina, choroid, and sclerotic.

2. "On Cancrum Oris," by Dr. GLYNN.

The author confined the term to those cases in which gangrene of the lips or cheeks is a prominent feature. He did not think it was of the nature of a specific disease; because, 1st—It never attacks children as a distinct disease preceded by characteristic symptoms, though some have affirmed that it does. 2nd—It is always the consequence of some severe illness, especially of the eruptive fevers, and, of these, measles most frequently precedes it. 3rd—It is not infectious, though sometimes epidemic, but only as a consequence of the exanthemata. It very rarely attacks several children in a family simultaneously. It appears to depend upon great deterioration of the blood, springing from a general adynamic state, which may originate from many and various depressing causes. It is much more rarely met with among adults than among children, though not unknown among the former. The facts that the mucous membrane of the mouth is more liable to disease in children, and that measles occur chiefly among them, account partly for their greater liability to cancrum oris. It has been known to occur at so early an age as nine days. It rarely attacks both cheeks, except as the result of mercurial salivation. Girls are most subject to it, and the majority of cases occur in large towns and manufacturing districts. It is emphatically a disease of the poor. Sometimes symptoms almost like scurvy are present, and the author expressed the opinion that it is not improbable

some intimate relation may exist between scurvy and cancrum oris. He did not believe that mercury is the most common cause of the disease, as some think. He considered the gangrene to be the result of a low, erysipelatous inflammation, commencing in the mucous membrane of the mouth. Gangrene of other parts may occur as complications, also pneumonia which is very common, pleurisy, pericarditis, and other diseases of the mucous and serous membranes. The rate of mortality in cancrum oris has been excessively high. With regard to treatment, the author remarked, that before applying escharotics, the general condition should be considered, rather than the local. Nitric acid is useful at first, but its repeated application is injurious. Antiseptics are of great use. Tonics and stimulants constitute the proper internal treatment. The author gave the details of two cases, treated successfully by the use of chlorate of potash wash, and the internal administration of ammonia, chlorate of potash and bark, with beef-tea, wine and brandy.

8. "On Infanticide and Abortion, as suggested Institutions," by Dr. E. WHITTLE.

The author brought the subject forward, in consequence of the proposition made by the London Dialectical Society, that the medical profession should devise some scheme to limit the number of births, without injury to the health of the married couples, on the assumption that large families were unquestionable evils. He severely criticised the philosophy of Malthus, as well as a work by 'Marcus,' published in 1838, "On the Possibility of Limiting Populousness." The opinion contained in the latter work, viz., "that an excess of population is at once the main evil, and the main cause of all the other evils that affect human society," was advocated by some at the present day. He then alluded to a work published in 1841, by Thos. Doubleday, on "The True Theory of Population," in which the principle was laid down, that in nature a general law exists, whereby fecundity is stimulated by a condition of depletion, and checked by a condition of repletion,—this applying to both the vegetable and animal kingdoms,—and thus the population of a nation is influenced by the social condition of its

people. Several facts from the animal and vegetable kingdoms were adduced in support of this principle, as well as from the state of the world at various periods of its history. The author declared emphatically that medicine is not the science of the day that points to infidelity and vice; and that the members of the medical profession abhor the unnatural projects which have been proposed.

4. "Cases illustrating the relative value of Excision and Amputation," by Mr. BARNES.

The author brought forward a number of cases of excision of the elbow, wrist, hip, knee, ankle, and tarsus, and compared their results with those of amputation. His general conclusions were as follows:—That in making a comparison between excision and amputation, we have to consider, 1st—the relative mortality of each operation. 2nd—the duration and nature of the progress towards recovery. 3rd—the nature of the results. Excision is favourable in the case of the elbow joint, but there are two dangers, viz., bony ankylosis, from the removal of too little bone, and a useless appendage from the removal of too much bone, or the too-early extension of the limb. As regards the wrist, it is very difficult to excise it, without injury to the tendons, which would render the operation comparatively valueless. Excision of the hip-joint is decidedly unfavourable. No general answer can be given in respect to the knee-joint, each case being decided on its own merits; the danger to life is greater in excision than in amputation, and the progress towards recovery is often tedious. Where the disease is the result of injury, or where the constitution is not worn out and exhausted, or of a thoroughly strumous character, excision may be performed. The results of excision of the ankle joint are not favourable, and it is a very difficult operation. The cases in which he had excised some of the tarsal bones, all did well.

Mr. Barnes gave the following as his experience of these operations, required for diseased conditions of the several articulations.

Of the elbow joint he had had seven excisions, and all recovered.

The wrist joint he had partially excised once.

The hip joint he had excised twice, and both cases died; while in one instance he had amputated through the joint with success.

The knee joint he had excised six times, with two recoveries. He had amputated above or through the joint in seventeen instances, of which twelve recovered.

In one instance he had excised the ankle with success; of eight amputations below the knee, four recovered.

He had excised the tarsal bones (os calcis, cuboid, and cuneiform bones), and all these cases recovered.

Of thirteen amputations of the ankle joint (for the most part according to Mr. Syme's method), eleven made good recoveries, and two died.

5. "On Cod Liver Oil as a remedial agent in Typhus Fever," by Dr. GEE.

The author first entered into the question of the nature of typhus fever, the chemical changes accompanying it, and the objects aimed at in its treatment. In referring to the chemical changes which take place in typhus fever, Dr. Gee summed them up as consisting in a rapid and an inordinate metamorphosis and destruction of the tissues of the body, without an equivalent reproduction. Hence there is a great rise of temperature, with enlarged excretion of urea, uric acid, and probably carbonic acid. The result is that the patient performs an increased amount of work, with a semi-paralysed nervous system, with his blood contaminated by an excess of disintegrated tissue, and with a diminution of food, and impaired assimilative power. He remarked that he had given cod liver oil at the Fever hospital during the last few months, with the object that, having an affinity for oxygen, it might withdraw its action from the tissues, and afford a pabulum on which it might expend its energy, and thus relieve the system of a great source of danger; it would also be a source of nutrition, and thus there would be a conservation of vital and physical force. He first tried inunction, but afterwards gave it internally in drachm doses, with dilute hydrochloric acid (12 minims), mucilage, and tincture of orange-peel and water every one or two hours. The diet consisted of milk and beef-tea, with arrowroot. The author gave a brief history of eleven cases so treated, all of which recovered, convalescence taking place in from

eleven to eighteen days. He believed that since this treatment had been adopted, the recoveries had been above the average and the stimulants reduced two-thirds or three-fourths, while rapidity of convalescence has been very marked.

6. "On Lumbar Colotomy, in special reference to cases of Vesico-intestinal Fistula," by Mr. HARRISON.

The author gave a full account of the case of a lady in which he had been consulted, in whom a fistulous communication had been established between the bladder and the intestinal canal. Fæces passed in the urine, the bladder was very irritable, and there was intense pain over it when flatus was passed. Micturition was very distressing. The patient was very emaciated and enfeebled. An examination was made with the endoscope, and an opening about the size of a sixpence was seen a little to the left side of the fundus of the bladder. It was considered to be non-malignant, and the author believed it was due to dysenteric inflammation, from which the patient had suffered long and severely. It was determined to perform lumbar colotomy, the advantages anticipated from the operation being—1st, the alleviation of the distressing pain from flatus entering the bladder; 2nd, the contraction, if not complete closure, of the opening, if fæces were prevented from passing through it. A full description of the operation was given. The difficulties likely to be met with were also alluded to—1st, delay in finding the gut, owing to its being in a contracted state; 2nd, the peritoneum forming a distinct meso-colon, instead of being merely reflected over the front of the intestine. The patient experienced relief from the operation, but next morning became excited and tremulous, and afterwards fell into a state of syncope, from which she never rallied, and died about twenty-six hours after the operation. No post-mortem examination was permitted.

7. "Further Observations on the Use of Carbolic Acid, in Surgery," by Mr. HAMILTON.

He classified the cases in which carbolic acid has been used as—1st, those diseases and injuries in which repeated trials have satisfactorily established its superiority over every other treatment, when used in accordance with certain definite principles;

2nd, those where the evidence as to its effects are contradictory; 3rd, where it is injurious. The first division includes — 1, compound fractures; 2, injuries to joints, where the joint has been opened; 3, incised wounds; 4, gun-shot wounds; 5, large abscesses. The author gave the history of three severe cases, which he had treated successfully by carbolic acid. One was a case of wound into the knee joint, seen for the first time on the third day after the accident. The second was an extensive wound across the wrist, caused by machinery. The finger could be passed into the joint, and the carpal bones were found loose and displaced. The third patient had a wound, four inches long, on the side of the forehead, with fracture of the frontal bone. He considered that experience had fully borne out its value in the cases mentioned under the first class, and that all failures were due to a defect in the mode of carrying out the principle. The author noticed that the season of the year affects the results in this mode of treatment, and that in Autumn, when the air of the hospital was vitiated, suppuration did not appear to be so much kept in check by the acid, though it still had great power in preventing pyæmia or phlegmonous erysipelas. The second division contains burns and scalds, morbus coxæ, psoas abscess, sloughing wounds, syphilitic sores, chronic ulcers, sinuses and ulcers connected with carious bones, carbuncle, diphtheria, strumous ophthalmia, ophthalmia tarsi, and certain skin diseases. The author then made some observations on the 'germ theory,' which is the foundation on which the carbolic acid treatment is based. He remarked that it is probable there are several forms of germ-life, capable of producing distinct diseases, but that they cannot all be neutralised by this one agent, there being other substances destructive of them, at present unknown to us.

8. "On the Treatment of Puerperal Convulsions," by Dr. STEELE.

The treatment of this disease has been the subject of much dispute, owing to the different views held as to its pathology. With regard to blood-letting, the author considered it in some cases a remedy of great efficiency, in others equally powerful for

evil. One main object of this treatment is to diminish the quantity of blood in the vessels, and thus to relieve congestion of the brain and spinal cord. Hence it is useful in the simpler forms of this affection, dependent chiefly upon stimulation of the spinal cord, by excess of blood, or upon the mechanical pressure exerted by the blood on that organ, together with the counter-pressure of the distended brain on the medulla oblongata. It is indicated in general fulness of the vascular system, and where, during the violence of the fits, there is extreme congestion and pressure on the vessels of the head and neck. When albuminuria or uræmia is present blood-letting is not well borne, but it is sometimes of service, if judiciously employed, by eliminating the *materies morbi*. As regards '*artificial delivery*,' the plan formerly recommended, to empty the uterus in all cases as speedily as possible, is as dangerous in practice as it is unsound in principle. It is only when the presence of the fœtus in the uterus is the chief exciting cause, that its removal can do any good. No arbitrary rule can be laid down as to the mode of delivery, but the use of the forceps is preferable, if it can be applied. Chloroform is useful in many cases, if given judiciously, and not allowed to supersede the use of other means. In the course of the paper, the author gave the details of cases, illustrating the various modes of treatment.

9. "On Modern Theories about Lateral Curvature of the Spine," by Mr. BANKS.

The writer began by pointing out the pathological differences between antero-posterior and lateral curvature, insisting strongly upon the recognition of the fact that in the former there is a distinct disease of the spinal bones, which, if unchecked, goes on to their ultimate destruction; while in the latter there is no such disease, and it is only in advanced cases that any absorption of the vertebræ occurs, and then simply from the effects of pressure. The muscles are at fault; hence, he argued, the impropriety of all stiff mechanical supports, which, although for the time comfortable to the patient, tend ultimately to increase the evil by leading to total inaction and consequent atrophy of the spinal muscles. The object of treatment then should be to strengthen the muscles

which are weak; and to this end indiscriminate gymnastics are certainly not suited, but the greatest care should be taken to prescribe only those exercises suitable to the case. In order to make it clear what these should be, he entered into a description of the mode of production of lateral curvature, its comparative frequency in the two sexes, the age at which it occurs, &c., and criticised Mr. Barwell's idea of the cause of primary dorsal curvature being the preponderance of action of one serratus magnus muscle over the other, leading at first to rotation of the vertebræ and then to curvature of the spinal column. This idea seemed extremely ingenious, and while *per se* not sufficient to account (in the writer's opinion) for the prevalence of dorsal curvature in young females, and its occurrence so frequently upon one side, it yet must certainly form one of the several causes which produce the effect in question. The practical part of the paper was mainly occupied with a description of Mr. Barwell's method of treatment by his spinal elastic bandage, the use of a sloping seat, and certain forms of gymnastics. To these the writer had given a very fair trial, and he thought the principles of treatment laid down by Mr. Barwell were the best proposed; and he felt certain that the patients upon whom he had employed this plan of treatment had been greatly benefited by it.

10. "On the Administration of Carbolic Acid in Enteric Fever," by Dr. PARSONS.

After alluding to the different views held at the present day, as to whether the diarrhœa should be stopped or not, the author observed that there were two kinds of diarrhœa in enteric fever, of totally different characters, one occurring in the early part of the disease, and the other from the tenth to the fourteenth day. The first form is best treated by mineral acids, calomel, or a combination of grey powder and Dover's powder; but, in the second form, carbolic acid is of great value. It is useless in ordinary diarrhœa. The author had given it in several cases, in the form of the glycerine of carbolic acid (in doses of 15 ms. for adult), with mucilage, chloric ether, and peppermint water. He remarked that, in all the instances in which he had administered carbolic acid, the

ABSTRACT OF THE PROCEEDINGS OF THE
LIVERPOOL NORTHERN MEDICAL SOCIETY,
FOR 1868.

We select the following as possessing special interest from among the—

I.—*Pathological Specimens exhibited.*

By Dr. NOTTINGHAM.

A mass of large hydatiform cysts, removed by ovariectomy. The patient was a married woman, aged 30. She had one child, and attributed the disease to a kick received in the abdomen two years previously. The peculiar semi-fluid character of the enlargement rendered the diagnosis between ascites and ovarian disease somewhat obscure. At the operation it was found that there were extensive adhesions to the liver and diaphragm. The patient made a very good recovery.

By Mr. HARRIS.

1. A specimen of diseased liver, apparently resulting from rupture of some of the hepatic vessels two years prior to decease. The symptoms were rigors, followed by pain and fulness in the right hypochondrium and epigastrium, with vomiting of a quantity of dark grumous fluid; febrile symptoms, etc.

2. Several gall-stones, removed from a person in whom, during life, their presence had not been suspected. There was fatty degeneration of the heart, liver, and kidneys; and a layer of adipose tissue, four inches thick, existed in the abdominal wall.

By Dr. PARKER.

Specimens of urinary calculi, each having a hair for its nucleus.

By Dr. PARSONS.

1. A left superior maxilla, which had become necrosed in consequence of injury to the alveolar process, opposite the first molar tooth, eleven years previously. With the exception of the nasal process, the bone came away entire.

2. Two feet, spontaneously amputated during the course of 'senile gangrene.' The case had been attended by him 13 years ago, but the patient died only very recently.

By Dr. GOODALL JONES.

The larynx, trachea, and pharynx of a patient who had recently died of an abscess which appeared to have originated in the thyroid body, and which burst into the trachea.

By Dr. CHARLES HILL.

A portion of melanotic liver, from a patient who had had excision of the right eye, performed for melanosis of that organ. The liver weighed 15 pounds.

By Dr. IRVINE.

A constricted pylorus, barely admitting the handle of a pen. The chief symptom during life was severe jaundice.

By Dr. COLLES ANDERSON.

1. Two calculi, removed from the urethra of a man who had been suffering for three years from urinary fistula.

2. A fibro-cystic tumour, removed from the parotidean region. It had existed for 9 years. No facial paralysis resulted from the operation.

3. The uterus of a woman who had given birth to two living children, and had aborted six months previous to decease. It presented a white, cartilaginous appearance. The cavity was nearly obliterated, and the os with difficulty discovered. The uterus was adherent to the rectum.

By Dr. O'CONNOR.

Melanosis of the left lobe of the liver, and greater portion

of the stomach. It was noticed that, from the margin of the fifth rib to the crest of the ilium, on the surface corresponding to these organs, the body had retained its natural caloric eighteen hours after death, while the rest of the body was perfectly cold.

II.—Cases related or exhibited.

By Mr. HARRIS.

1. "Case of *periodic hæmorrhage from the urethra*, without any appreciable cause." At the *post-mortem* examination, an ulcer, about the size of a half-crown, was found a little to the right side and above the neck of the bladder. A large coagulum was present in the bladder.

2. "Two cases of *suppuration of ovarian cysts after tapping*." In the first case, the operation was performed without the previous introduction of the catheter, the patient having stated that she had just made water. The fundus of the bladder was wounded, and retention of urine ensued. The urine became mixed with the pus of the cyst, as proved by the smell of urine in the discharge from the wound, and by the presence of pus in the contents of the bladder. The patient died thirty months after the operation. The second case occurred in a married woman, aged 33. The *foetid* character of the discharge necessitated the dilatation of the wound. The cyst was injected about once a week, with warm water and a little carbolic acid. The discharge was profuse for three months, and only ceased entirely seven months after the operation. The catamenia were restored, and the patient recovered perfectly. A tumour, the size of an orange, remained in the place of the cyst.

3. A girl was introduced, 9 years of age, having a congenital varicose tumour on the left side of the neck, extending from the mastoid process to the clavicle. No operative interference seemed advisable, as there was such an extensive vascular anastomosis.

4. "Case of epilepsy in connection with cyanosis and albuminuria." The patient was a female, aged 47, with congenital

cyanosis. A succession of epileptic fits terminated her existence in a week.

By Dr. MATTHEW HILL.

"Case of irregular ossification," in a girl aged 6 years. The muscles of the arm and thorax were ossified, and the shoulder- and elbow-joints were ankylosed.

By Dr. NOTTINGHAM.

1. A patient was introduced, on whom excision of the knee-joint had been performed. The limb was 6 inches shorter than its fellow, but, by means of an iron step, he was enabled to walk with great comfort.

2. A boy was brought forward, aged 13 years, whose hip-joint had been excised $4\frac{1}{2}$ years previously. There was a very satisfactory joint; rotation, flexion, and extension being well performed. There was about $3\frac{1}{2}$ inches shortening, but, with the aid of an iron step, the patient could walk for miles without any sense of fatigue.

By Mr. A. M. BLIGH.

"Case of catarrh of the bladder, in which the whole of the mucous coat was expelled." Retention of urine followed instrumental delivery, and incontinence succeeded. The catheter was passed frequently for a few days, and afterwards it was allowed to remain in altogether. Mucilaginous drinks were freely given, with hyoscyamus and pareira brava. A membranous shred was seen projecting from the urethra, and, by gentle traction upon it, the whole of the mucous coat of the bladder was removed, studded with numerous scintillating crystals. Mucilaginous injections were then used to protect the submucous coat, and injections of tannin to arrest hæmorrhage, with opium to relieve pain. The patient recovered, and has since given birth to another child.

By Dr. PARSONS.

1. A patient, aged 30, with complete occlusion of the posterior nares. There was total loss of smell, and a dry state of the Schneiderian membrane.

2. "Case of cholera," treated by capsicum, followed by castor oil. The capsicum was given in a single dose of 30 grains, in half a tumblerful of water, with the view of preventing impending collapse. Dr. Parsons had found this treatment very successful during the epidemic of 1866.

By Mr. SHELDON.

"Case of spina bifida," in a child 11 weeks old. The child was healthy, but the tumour, which occupied the sacral region, was growing rapidly. In connection with this case, Dr. Irvine remarked that he had operated successfully for spina bifida, in the lumbar region, in a child a week old, and it had lived for $2\frac{1}{2}$ years.

By Mr. ROWLANDS.

"Two cases of puerperal fever," successfully treated by injecting the vagina and rectum with diluted carbolic acid (1 part in 80 of water). Turpentine stupes were applied over the abdomen, and opium given internally.

By Mr. WILLIAM BURROWS.

"Two cases of puerperal fever," successfully treated by antiseptic injections, together with the internal administration of opium. In one case, Condyl's fluid (1 to 40) was used, and in the other carbolic acid. Mr. Burrows preferred the former, because its inodorous character enabled him to say when the fœtor was corrected. He believed that antiseptic injections, by correcting depraved uterine secretion, tended materially to arrest the progress of the disease.

By Dr. GOODALL JONES.

"Case of catalepsy," which terminated fatally on the 13th day. The cataleptic state was preceded by a silent, morose, and fretful manner. There had been no constitutional disturbance, nor menstrual irregularity, to account for this. Strong galvanic currents failed to produce any muscular action.

By Dr. SAMUELS.

"Twenty-one cases of enteric fever," of which 10 had occurred in children, and 11 in adults. Only one death resulted. The eruption was present in nearly every case, and in many of them as early as the third day.

By Dr. SPEERS.

A child was brought forward, aged 3 years and 9 months, suffering from extensive phagædenic ulceration of the parietal region. The whole of the squamous portion of the temporal bone was denuded, and a good part of the mastoid.

By Mr. PARKER.

1. "Case of ovariectomy, performed in this town, in 1848," by the late Mr. Banner. Death occurred on the third day, from peritonitis.

2. "Case of labour, in which the descent of the head was arrested by the presence of a tumour occupying the recto-vaginal pouch." The wall of the rectum appearing to be thinner than that of the vagina, the contents of the tumour were evacuated through it, and about 80 ounces of thick glutinous fluid came away. Delivery of a still-born child ensued 19 hours afterwards. The discharge gradually became offensive, and the patient succumbed to hectic 6 months after her confinement.

By Mr. TOWNSON.

"Three cases of erysipelas," which occurred in different members of a family, tending to show the infectious character of the disease. In each, the disease ran a precisely similar course. The treatment consisted of tartar emetic and low diet, with the local application of flour. Mr. Townson deprecated the use of stimulants in this disease, as, in his experience, it led to delirium. A discussion took place upon the treatment of this disease, several members dissenting from Mr. Townson's view.

III.—*Papers read.*

1. "On the use of Large Doses of Tincture of Digitalis," by Dr. PARSONS.

The author related various cases of delirium tremens, in which he had used it; and the result of his experience was, that it is beneficial in those cases only where there is low muttering delirium, with a weak, flickering, and irregular pulse. Where there is delirium ferox, with a bounding pulse, large doses of digitalis do no good. He drew attention to the efficacy of digitalis in menorrhagia, in the insomnia of certain forms of cardiac disease, and, above all, in the critical stage of typhus, when a timely relief often enables the patient to resist the final effort of this disease. A tabulated report was submitted of the cases in which the author had used tincture of digitalis in half-ounce doses. With regard to its action, he believed that in small doses it is first a stimulant, and subsequently a depressant; while, in half-ounce doses, it is a most powerful stimulant, especially to the sympathetic system, as instanced by its power of increasing the contraction of the heart and uterus, by its diuretic properties, and also by its purgative and emetic action.

2. "On the administration of Oil of Sandalwood, in Gleet," by Mr. PARKER.

He recommended its use in all chronic cases of this affection, and related instances in which he had employed it with great advantage.

3. "On a New Preparation, the Lactate of Iron and Quinine," by Dr. KIRK.

He stated it to be specially adapted for those cases where chalybeates were indicated, and where, from derangement of the digestive functions, the ordinary ferruginous compounds were not tolerated.

4. "Cases of Puerperal Convulsions, with remarks on the various remedies used in the treatment of this disease," by Dr. O'CONNOR.

He related three cases, each representing a different type of this disease, the *hyperæmic*, the *anæmic*, and the *apoplectic*. In considering the different remedies, he deprecated *stimulating enemata* and *purgatives*, because they produced excitation of the uterus, which he considered to be the proximate cause of the disease. *Tartar emetic* he deemed inapplicable, unless the stomach was

overloaded; in continued nauseating doses he believed it to be injurious. *Chloroform* is an invaluable remedy in anæmic and hysteric convulsions, when there is excessive pain, as in the slow dilatation of a rigid os; but it is not admissible in the hyperæmic form, where stertor and stupor continue in the intervals between the paroxysms. *Opium* is suitable in similar cases. The author expressed himself strongly against delivery by turning, except in cross births, and believed that delivery by the natural expulsive powers was the safest. In cases where the head has descended into the pelvis, application of the forceps or delivery by perforation is advisable, seeing that when the os is fully dilated, such interference does not increase the excitation of the uterus.

5. "On Climatology," by Dr. JOHN BLIGH.

6. "On Superfoetation, with cases illustrating the possibility of its occurrence, by Dr. IRVINE.

7. "On the recent Epidemic of Enteric fever in Bootle," by Dr. MATHEW HILL.

Of 482 cases only eight died, but many of the so-called recoveries would ere long succumb to some secondary disease. The ages at which the cases occurred were as follows:

Below 5 years.	Between 5 and 10.	Between 10 and 20.	Between 20 and 30.	Between 30 and 40.	Between 40 and 50.	Above 50.
108.	100.	87.	88.	35.	13.	6.

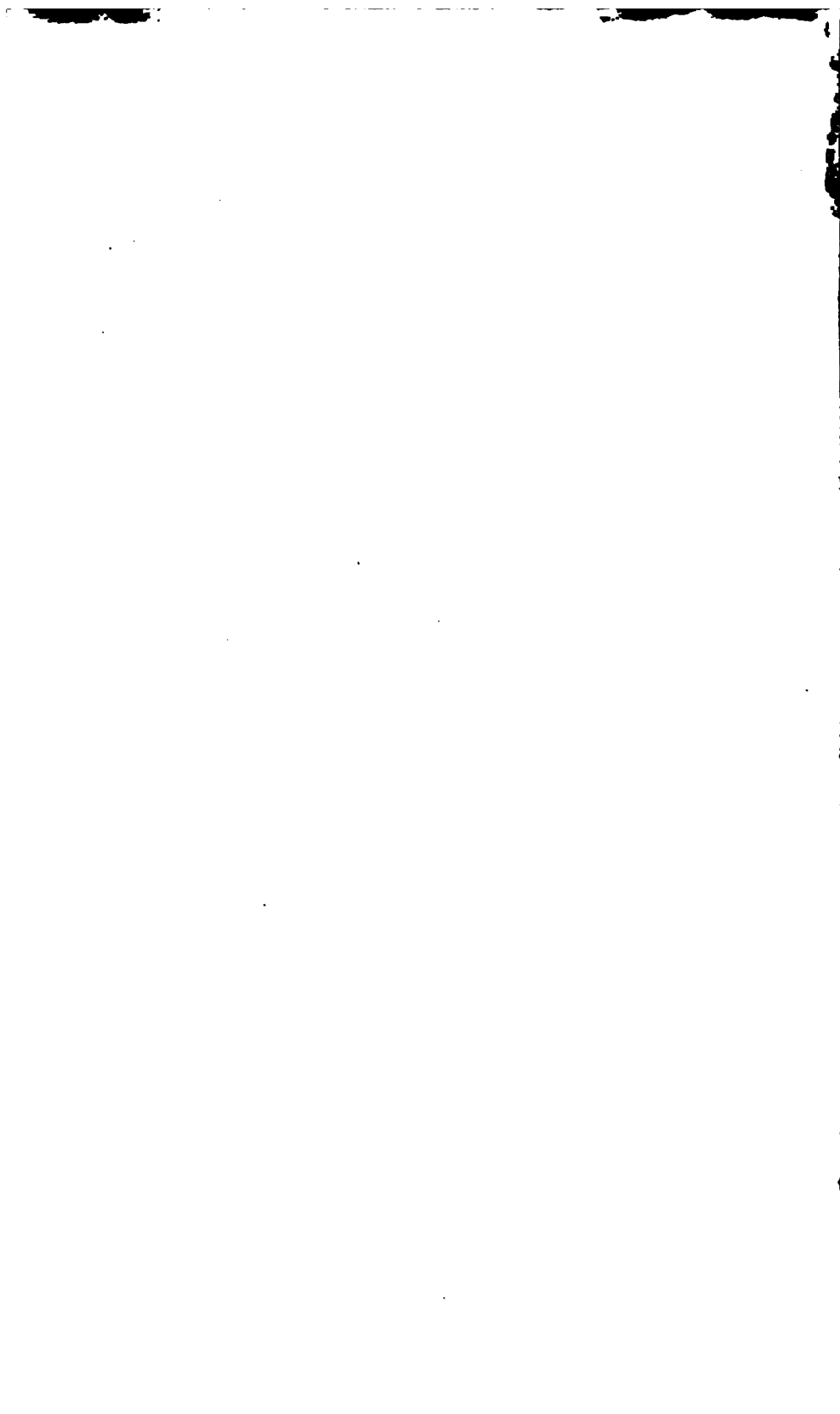
The author believed that he had succeeded in arresting the progress of many cases by early treatment. After detailing the symptoms usually found in such cases, he dwelt particularly upon the appearance of the tongue, which he said was a true index of the stage and progress of the disease. His treatment consisted, in the early stages, of warm baths and diaphoretics, then quinine, nitro-muriatic acid, chlorate of potash, Dover's powder in excessive purging, with occasional doses of opium to procure sleep; also sinapisms, or turpentine stupes, in tympanitis. He gave bland nutritious diet in the early stage, coupled with stimulants in the advanced stages. Stimulants were best administered in milk and egg-julep. With good nursing, few relapses occurred. The most frequent complications and sequelæ were sudamina, pustular and furuncular eruptions, parotid abscesses, blistering of

the skin, and hæmorrhage from the bowels. One case died of hæmorrhage from the pharynx.

8. "On Cases of Chorea, treated by Conium," by Dr. JOHN BLIGH.

He considered conium specially applicable in such cases, and he administered it in doses of from ʒi. to 1 oz. of succus conii for long periods. He did not believe it to be a cumulative medicine.

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